

150TH ANNIVERSARY YEAR
1821-1971

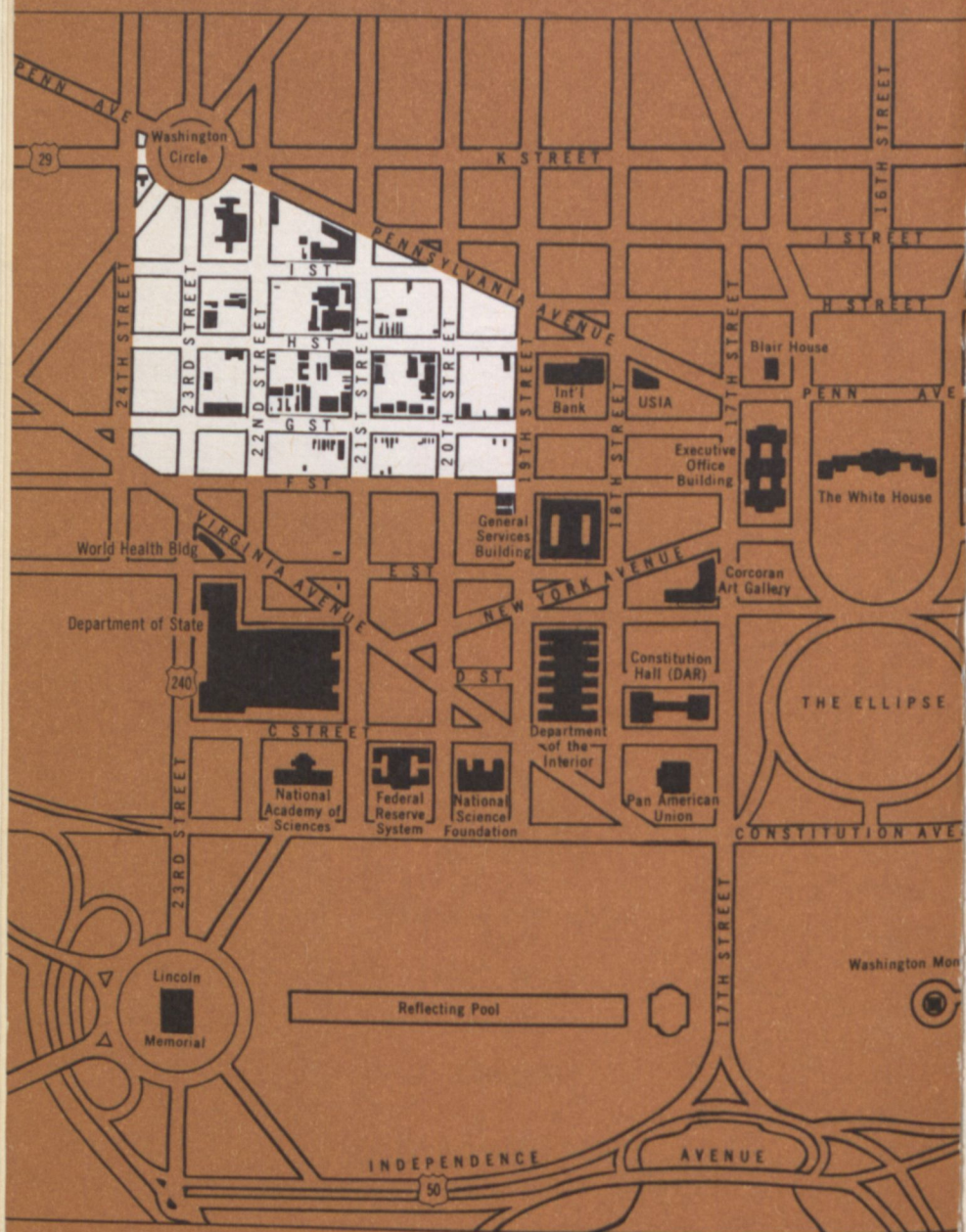
THE GEORGE WASHINGTON UNIVERSITY BULLETIN



UNDERGRADUATE
AND
GRADUATE
CATALOGUE



1970-1971



THE GEORGE WASHINGTON UNIVERSITY CAMPUS / WASHINGTON, D.C.

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THE GEORGE WASHINGTON UNIVERSITY BULLETIN

UNDERGRADUATE AND GRADUATE CATALOGUE 1970-71

Arts and Sciences, Education,
Government and Business Administration,
Public and International Affairs

This catalogue lists the programs and faculties of Columbian College of Arts and Sciences, the Graduate School of Arts and Sciences, the School of Education, the School of Government and Business Administration, and the School of Public and International Affairs.

It also contains information on the Division of University Students, in which students may register for University courses for credit or as auditors without pursuing degree programs.

For information concerning the University's programs and faculties in Engineering and Applied Science, Law, and Medicine, request the appropriate catalogue.

FACTS ABOUT GEORGE WASHINGTON UNIVERSITY

<i>General Information</i>	Private, nonsectarian, coeducational, founded 1821
<i>Location</i>	Washington, D. C., bounded by Pennsylvania Avenue and 19th, F, and 24th Streets, N.W.
<i>Number of Students</i>	14,566 (9,438 men, 5,118 women)
<i>Number of Undergraduates</i>	5,487 (2,739 men, 2,748 women)
<i>Geographical Origin of Students</i>	50 states, District of Columbia, 92 countries; 20% are from the Washington area
<i>1970-71 Tuition</i>	Undergraduate: \$1,900 for two semesters; graduate: \$68 for each semester hour (see page 29)
<i>Number of Full-time Faculty</i>	722 (73% with Doctoral degrees)
<i>Number of Part-time Faculty</i>	327 (includes some of the most distinguished men in Washington who serve as professorial lecturers)
<i>Residence Hall Space</i>	2,212 (an additional 1,500 students reside in fraternity houses, rooms, and apartments on or near the campus)
<i>Room and Board</i>	Cost varies from \$1,160 to \$1,310 for the academic year (see page 56)
<i>Campus Organizations</i>	145

Undergraduate majors: Accounting, American Civilization, American Literature, Anthropology, Applied Mathematics, Applied Statistics, Art History and Theory, Biology, Botany, Business Administration, Business and Economic Statistics, Chemistry, Chinese Studies, Civil Engineering, Classical Archeology and Greek, Classical Humanities, Dramatic Art, Economics, Electrical Engineering, Elementary Education, English Literature, Fine Arts, French Language and Literature, Geography, Geology, Germanic Languages and Literatures, History, International Affairs, International Business, Journalism, Latin, Latin American Studies, Mathematical Statistics, Mathematics, Measurement Science, Mechanical Engineering, Medical Technology, Music (Applied, History and Literature, Theory), Philosophy, Physical Education, Physics, Political Science, Premedicine, Psychology, Public Affairs, Religion, Russian Language and Literature, Secondary Education, Sociology, Spanish American Literature, Spanish Language and Literature, Speech Communication, Speech Pathology and Audiology, Zoology.

Study leading to graduate or professional degrees is offered in the Graduate School of Arts and Sciences, the National Law Center, the School of Medicine, the School of Engineering and Applied Science, the School of Education, the School of Government and Business Administration, and the School of Public and International Affairs.

UNIVERSITIES are undergoing change, either drastically or slowly, as they have been for centuries. Whatever the changes, the one premise on which universities are based remains constant: universities are for learning—for acquiring learning, for transmitting learning, and for the exploration that yields new learning. Any other objective is unworthy of a university, and any other purpose is incompatible with the student and his relationship to the institution.

The faculty, through scholarship and research, extends learning, and it transmits learning by teaching. The student learns from the faculty, the library, and the laboratory—if he accepts, as he must accept, learning as his objective. This learning does not take place in a vacuum; in addition to the particular content of learning, the student will develop certain habits of mind—analytical thinking, powers of insight, self-examination, and the use of rational discourse—that will serve him throughout his personal and professional life.

Within this basic context, George Washington University invites the student to take up his residence in order that his energies, interests, and talents may be directed to learning.

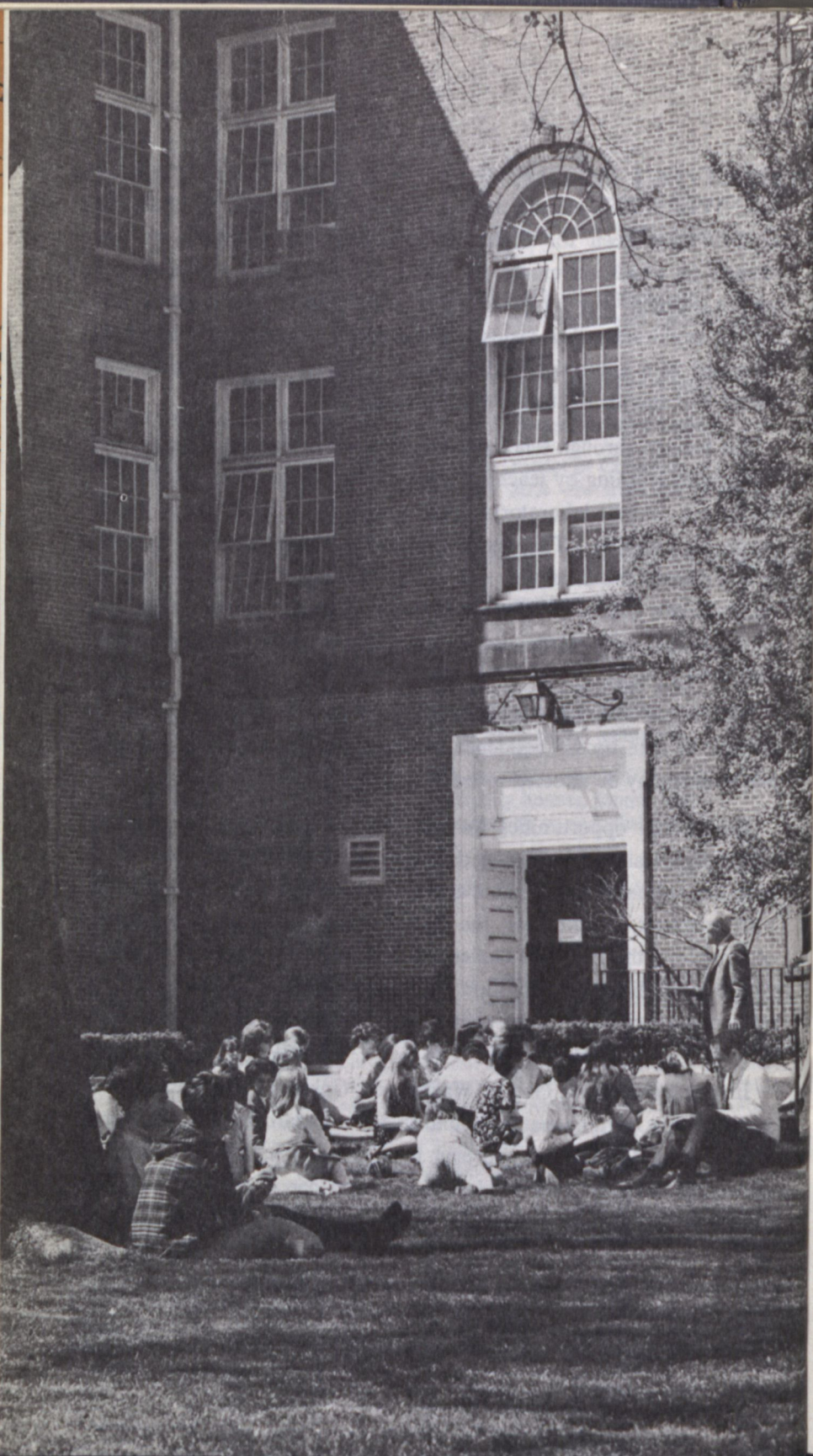
Exceptional opportunities for learning are made possible because of the University's location in the heart of the Nation's Capital. For example, cooperative programs are conducted in various fields of study with members of Congress, the Smithsonian Institution, the Library of Congress, the National Gallery of Art, and other Federal and private organizations. In addition to these programs, Washington presents opportunities for observation, study, service, and recreation limited only by the student's time, energy, and imagination.

In this atmosphere, George Washington University seeks to provide a matrix for learning not available in the standard university education, so that no graduate can ever forget that as a student he was at the center of things and that he must forever carry additional responsibility in and for society, because of the opportunity that was his.

LLOYD H. ELLIOTT

President

The George Washington University



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THE UNIVERSITY CALENDAR 1970-71

1970	1971	
SEPTEMBER S M T W T F S 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30	JANUARY S M T W T F S 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31	MAY S M T W T F S 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31
OCTOBER S M T W T F S 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31	FEBRUARY S M T W T F S 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28	JUNE S M T W T F S 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30
NOVEMBER S M T W T F S 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30	MARCH S M T W T F S 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31	JULY S M T W T F S 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31
DECEMBER S M T W T F S 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31	APRIL S M T W T F S 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30	AUGUST S M T W T F S 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31

1970-71 FALL SEMESTER

- September 11** Orientation for students from foreign countries *Friday*
September 14 Placement tests and advising for entering freshmen who did not attend Summer Advance Registration sessions *Monday*
September 14-15 Advising *Monday-Tuesday*
September 16 Placement tests and advising for transfer students *Wednesday*
September 16 University Faculty Assembly Meeting *Wednesday*
***September 17-19** Registration *Thursday-Saturday*
Application for February graduation due as part of registration
September 21 Classes begin *Monday*
October 10 Application for November Ed.D. Comprehensive Examinations due *Saturday*
October 15 Board of Trustees Meeting *Thursday*
October 16 Columbian College of Arts and Sciences Faculty Meeting *Friday*
November 7 National Teacher Examinations *Saturday*
November 11 Veterans Day (holiday) *Wednesday*

* Registration is conducted alphabetically according to the first letter of the student's surname. The alphabetical breakdown and the hours of registration will be stated in the *Schedule of Classes*, which is available well in advance of each semester.

- November 14 Ed.D. Comprehensive Examinations *Saturday*
 November 14 Application for December Ed.D., Ed.S., and M.A. in Ed. Comprehensive Examinations due *Saturday*
 November 25 Thanksgiving recess begins after last class *Wednesday*
 November 30 Classes resume *Monday*
 December 4-5 School of Government and Business Administration Master's Comprehensive Examinations *Friday-Saturday*
 December 7 D.B.A., D.P.A., and Ph.D. Dissertations of February candidates due *Monday*
 December 11-12 School of Public and International Affairs Master's Comprehensive Examinations *Friday-Saturday*
 December 19 Ed.D., Ed.S., and M.A. in Ed. Comprehensive Examinations *Saturday*
 †December 19 Last day of fall-semester classes *Saturday*
 December 19 Christmas recess begins after last class *Saturday*
 January 4 Master's Theses and Ed.D. Dissertations of February candidates due *Monday*
 January 4-8 Fall-semester reading period *Monday-Friday*
 January 6 Columbian College of Arts and Sciences Faculty Meeting *Wednesday*
 January 9-21 Examination period *Saturday-Thursday*
 January 21 Board of Trustees Meeting *Thursday*

1971 SPRING SEMESTER

- January 25 Placement tests *Monday*
 January 25-27 Advising for freshmen, sophomores, and all new students *Monday-Wednesday*
 *January 28-30 Registration *Thursday-Saturday*
 Application for June graduation due as a part of registration
 February 1 Spring-semester classes begin *Monday*
 February 9 University Faculty Assembly Meeting *Tuesday*
 February 15 Winter Convocation and Observance of the University's Sesquicentennial (holiday) *Monday*
 March 5 Columbian College of Arts and Sciences Faculty Meeting *Friday*
 March 18 Board of Trustees Meeting *Thursday*
 March 30 D.B.A., D.P.A., and Ph.D. Dissertations of June candidates due *Tuesday*
 April 1 Application for April Ed., Ed.S., and M.A. in Ed. Comprehensive Examinations due *Thursday*
 April 3 Spring recess begins after last class *Saturday*
 April 13 Classes resume *Tuesday*

* Registration is conducted alphabetically according to the first letter of the student's surname. The alphabetical breakdown and the hours of registration will be stated in the *Schedule of Classes*, which is available well in advance of each semester.

† In certain courses, classes may be continued through the fall-semester reading period, January 4-8.

- April 16-17* School of Government and Business Administration Master's Comprehensive Examinations *Friday-Saturday*
- April 17* National Teacher Examinations *Saturday*
- April 19* Ed.D. Dissertations of June candidates due *Monday*
- April 23-24* School of Public and International Affairs Master's Comprehensive Examinations *Friday-Saturday*
- May 1* Ed.D., Ed.S., and M.A. in Ed. Comprehensive Examinations *Saturday*
- May 3* Master's Theses of June candidates due *Monday*
- *May 8* Last day of spring-semester classes *Saturday*
- May 10-14* Spring-semester reading period *Monday-Friday*
- May 12* Columbian College of Arts and Sciences Faculty Meeting *Wednesday*
- May 15-27* Examination period *Saturday-Thursday*
- May 20* Board of Trustees Annual Meeting *Thursday*
- May 31* Memorial Day (holiday) *Monday*
- June 6* Commencement *Sunday*

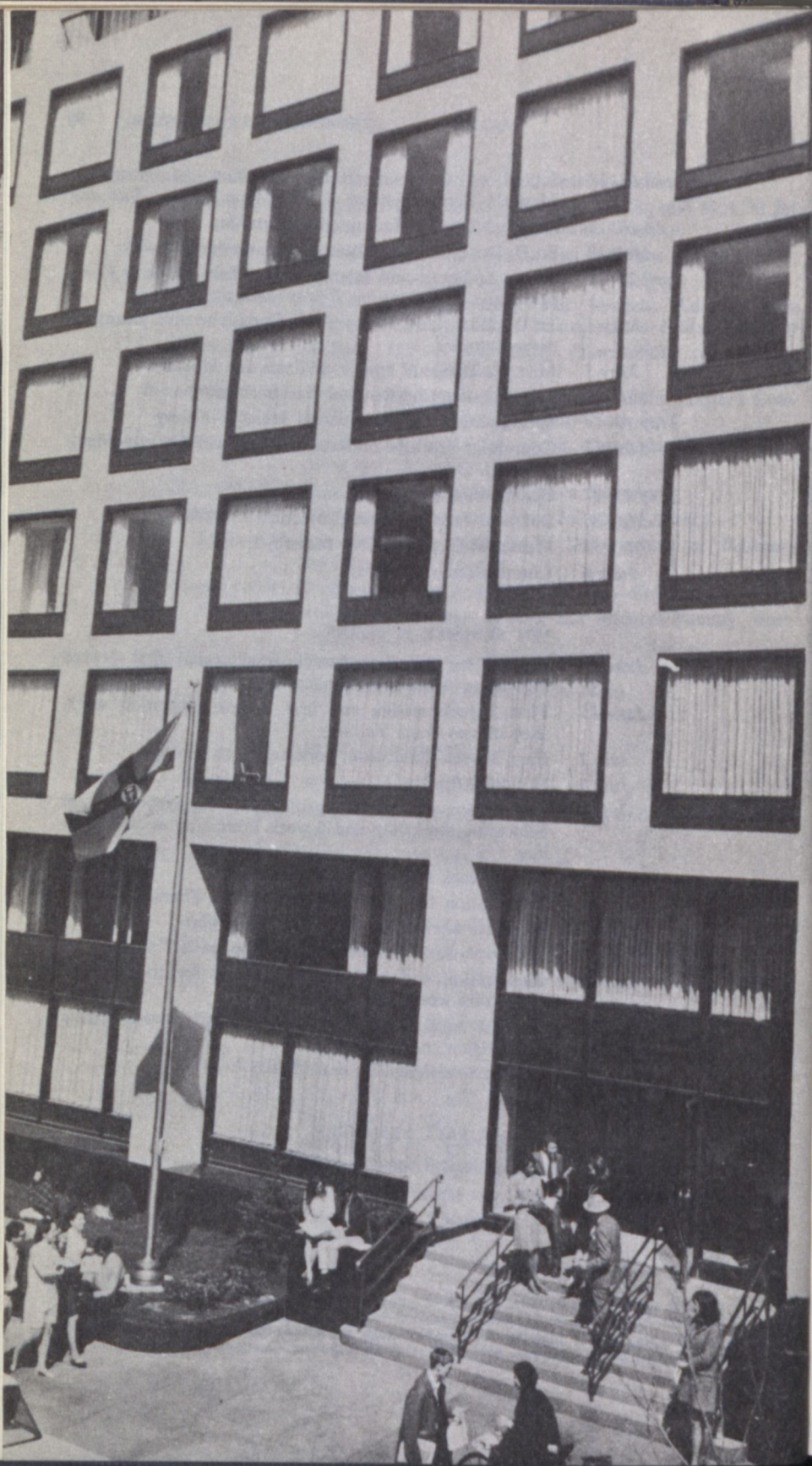
1971 SUMMER SESSIONS

- June 14* Registration for first 5-week session and first 3-week Education workshop *Monday*
- June 15* First 5-week session and first 3-week Education workshop classes begin *Tuesday*
- July 2* First 3-week Education workshop ends *Friday*
- July 5* Holiday *Monday*
- July 6* Registration and beginning of classes for second 3-week Education workshop and 6-week Education session *Tuesday*
- July 21* First 5-week session ends *Wednesday*
- July 22* Registration for second 5-week session *Thursday*
- July 23* Second 5-week session classes begin *Friday*
- July 23* Second 3-week Education workshop ends *Friday*
- July 26* Registration and beginning of classes for third 3-week Education workshop *Monday*
- August 13* Third 3-week Education workshop and 6-week Education session ends *Friday*
- August 27* Second 5-week session ends *Friday*

1971-72 FALL SEMESTER

- September 16-18* Registration *Thursday-Saturday*

* In certain courses, classes may be continued through the spring-semester reading period, May 10-14.



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THE UNIVERSITY

HISTORY

THE GEORGE WASHINGTON UNIVERSITY had its beginning in 1821 as The Columbian College in the District of Columbia. The name of the institution was changed in 1873 to Columbian University and in 1904 to The George Washington University. The debt of the University to George Washington, whose name it bears, is an intangible one.

George Washington, as President and as private citizen, had urgently insisted upon the establishment of a National University in the Federal City. There he hoped that, while being instructed in the arts and sciences, students from all parts of the country would acquire the habits of good citizenship, throwing off local prejudices and gaining at first hand a knowledge of the practice, as well as the theory, of republican government. To further the materialization of his hopes, Washington left a bequest of fifty shares of The Potomac Company, "towards the endowment of a University to be established within the limits of the District of Columbia, under the auspices of the General Government, if that government should incline to extend a fostering hand towards it." The Congress never extended "a fostering hand." The Potomac Company passed out of existence, and Washington's bequest became worthless.

Fully conscious of Washington's hopes, but motivated primarily by a great missionary urge and the need for a learned clergy, a group of dedicated ministers and laymen sponsored a movement for the establishment of a college in the District of Columbia. Inspired largely by the zeal and energy of the Reverend Luther Rice, they raised funds for the purchase of a site and petitioned Congress for a charter. After much delay and amendment, Congress granted a charter which was approved by President Monroe on February 9, 1821. To safeguard the College's nonsectarian character it provided "That persons of every religious denomination shall be capable of being elected Trustees; nor shall any person, either as President, Professor, Tutor or pupil, be refused admittance into said College, or denied any of the privileges, immunities, or advantages thereof, for or on account of his sentiments in matters of religion."

During the entire time when the institution was known as Columbian College, its activities were centered on College Hill, a tract of forty-six and a half acres between the present Fourteenth and Fifteenth Streets extending north from Florida Avenue to somewhat beyond Columbia Road. The Medical School was located downtown. For the better part of the Columbian Univer-

sity period, the buildings of the University were situated along H Street between Thirteenth and Fifteenth Streets. The Medical School group still remains there.

During the last half century the University's present plant has been developed in that section of the old First Ward familiarly known as "Foggy Bottom," between Nineteenth and Twenty-fourth Streets, south of Pennsylvania Avenue. The area is not without its reminders of historic interest to the University. President Monroe, who signed the Charter, lived at 2017 Eye Street. The first President of the Board of Trustees, the Reverend Obadiah B. Brown, was for fifty years the pastor of a church at Nineteenth and Eye Streets, and Washington selected Twenty-third and E Streets as the site of the National University he hoped to see established.

PURPOSE AND OBJECTIVES

The purpose of The George Washington University was to realize "the aspirations of Washington, Jefferson, and Madison, for the erection of a university at the seat of the Federal Government." Over the years it has been the aim to develop the University ideal in the Nation's Capital with a view toward meeting the changing needs of society while continuing to pursue the traditional principles of learning and research.

The George Washington University now rededicates itself and all the resources at its command to the pursuit of knowledge and its dissemination.

To this end:

The University recognizes its special opportunities in and obligations to one of the principal capitals of the world. It is a primary objective of the University to utilize its historical, geographical, and functional relationship to the Nation's Capital and the Washington community in continuing the development of a great nationally and internationally oriented university.

The University recognizes the needs of our times and accepts the challenge to develop each student's potential abilities to the fullest extent.

The University is and should remain privately controlled, nonsectarian, and co-educational.

Admission to the University is determined only in terms of the personal character and academic qualifications of the candidates.

A broadly based liberal education is fundamental to the total program of the University.

Expansion of graduate and professional studies and research and the utilization for this purpose of the excellent research facilities and materials available in the Nation's Capital are basic to the continuous development of the University's educational program.

The provision of superior instruction and facilities and the application of high standards of entrance qualifications and academic achievement to all students whether full-time or part-time, on-campus or off-campus, are major missions of the University.

A balanced program of student extracurricular activities is an integral part of the University program.

The University will continue to strive to meet the evident needs of an enlarged student body while governing the size of enrollment by its capacity to supply adequate staff and facilities for the excellent teaching and research which it espouses.



THE COLLEGES, SCHOOLS, AND DIVISIONS

George Washington University includes eleven colleges, schools, and divisions, as follows:

Columbian College of Arts and Sciences,* through its lower and upper divisions, offers four-year programs in the arts and sciences leading to the degrees of Bachelor of Arts, Bachelor of Science, and (in cooperation with the Department of Pathology and the University Hospital) Bachelor of Science in Medical Technology. The lower division also provides the first two years of the prelegal and premedical programs; the preprofessional work required for admission to the School of Education, the School of Government and Business Administration, and the School of Public and International Affairs; and a terminal Associate in Arts curriculum in Accounting. Columbian College has academic jurisdiction over the off-campus programs leading to the degrees of Bachelor of General Studies, Bachelor of Science in Environmental Health, Bachelor of Science in Geodetic and Cartographic Science, and Bachelor of Science in Oceanography. These off-campus programs are administered by the College of General Studies.

*The Graduate School of Arts and Sciences** offers advanced study and research leading to the degrees of Master of Arts, Master of Fine Arts, Master of Music, Master of Science, Master of Science in Forensic Science, and Doctor of Philosophy.

*The School of Medicine** offers work leading to the degree of Doctor of Medicine.

* Columbian College of Arts and Sciences and the Graduate School of Arts and Sciences cooperate with the School of Medicine in offering the combined degrees of (1) Bachelor of Arts and Doctor of Medicine and (2) Master of Science and Doctor of Medicine.

The National Law Center offers courses leading to the degrees of Juris Doctor, Master of Laws, Master of Comparative Law, Master of Comparative Law (American Practice), and Doctor of Juridical Science; and special programs in Continuing Legal Education.

The School of Engineering and Applied Science offers courses leading to the degree of Bachelor of Science in the following areas: Civil Engineering, Electrical Engineering, Measurement Science, and Mechanical Engineering. Graduate programs lead to the degrees of Master of Science, Master of Engineering Administration, and Doctor of Science.

The School of Education offers undergraduate programs leading to the degrees of Bachelor of Arts in Education and Bachelor of Science in Physical Education; graduate studies leading to the degrees of Master of Arts in Education, Master of Arts in Teaching, Education Specialist, and Doctor of Education.

The School of Government and Business Administration offers undergraduate programs leading to the degree of Bachelor of Business Administration and graduate programs leading to the degrees of Master of Arts in Government, Master of Arts in Health Care Administration, Master of Business Administration, Master of Public Administration, Master of Urban and Regional Planning; the Graduate Certificate in Health Care Administration; the degrees of Doctor of Business Administration and Doctor of Public Administration. The School also has academic jurisdiction over off-campus programs leading to the following degrees: Bachelor of Science in General Studies, Master of Science in Administration, and Master of Science in Business Administration. These off-campus programs are administered by the College of General Studies.

The School of Public and International Affairs offers undergraduate programs leading to the degree of Bachelor of Arts and graduate programs leading to the Certificate of the Institute for Sino-Soviet Studies and the degree of Master of Arts. The School has academic jurisdiction over the off-campus program leading to the degree of Master of Science in International Affairs, which is administered by the College of General Studies.

The College of General Studies supplements the adult education program of the University through campus and off-campus study; conferences, seminars, and special projects; and continuing education and noncredit programs. This College also administers the off-campus programs over which Columbian College of Arts and Sciences, the School of Engineering and Applied Science, the School of Government and Business Administration, and the School of Public and International Affairs have academic jurisdiction.

The Division of University Students makes available courses for students not candidates for degrees in this University.

The Summer Sessions.

ACADEMIC STATUS

George Washington University is accredited by its regional accrediting agency, the Middle States Association of Colleges and Secondary Schools.

The University is on the approved list of the American Association of University Women and is a member of the College Entrance Examination Board.

The National Law Center is a charter member of the Association of American Law Schools and is approved by the Section of Legal Education and Admissions to the Bar of the American Bar Association. The School of Medicine

is a member of the Association of American Medical Colleges and is one of the medical colleges which have been continuously approved by the American Medical Association. Curricula of the School of Engineering and Applied Science in Civil, Electrical, and Mechanical Engineering are accredited by the Engineers' Council for Professional Development. The School of Education is a charter member of the American Association of Colleges for Teacher Education and is accredited by the National Council for Accreditation of Teacher Education. The School of Government and Business Administration has maintained full membership in the Middle Atlantic Association of Colleges of Business Administration since 1961. It joined the Council on Graduate Education for Public Administration in 1966. By invitation, in 1968, the School became a charter academic member of the American Association of Collegiate Schools of Business Assembly. The programs in Public Accounting designed to prepare students for Certified Public Accountants examinations have been approved by the state boards of New York and of Maryland. The program in Hospital Administration has been accredited by the Association of University Programs in Hospital Administration since 1962. The Department of Chemistry is on the approved list of the American Chemical Society.

LOCATION

The University is in downtown Washington, between Pennsylvania Avenue and 19th, F, and 24th Streets, N.W. In immediately adjacent areas are the White House, the World Bank, the United States Information Agency, the Corcoran Gallery of Art, the Department of the Interior, the General Services Administration, the National Academy of Sciences, and the Kennedy Center for the Performing Arts.

GOVERNMENT

The University is privately endowed and is governed by a self-perpetuating Board of Trustees of which the President of the University is an ex officio member. The members of the Board are named for a period of three years and are divided into three classes. The members of one class are elected at each annual meeting to fill the places of the members whose terms of office expire. Two members of each class are nominated by the Alumni Association.

THE UNIVERSITY LIBRARIES

The Library collections of the University are housed in the University Library, the general library of the University, and in the departmental libraries of law and medicine.

These collections contain 494,116 volumes—about 350,000 in the University Library, about 102,000 in the Law Library, and about 40,000 in the Medical Library. Approximately 30,000 volumes a year are added to the Library's resources. Endowments, supplementing the University appropriation, provide books in the fields of American civilization, American literature, foreign service, history, public finance, and the social sciences; and gifts from many sources have enriched the collections. The Libraries currently receive about 4,000 periodicals.

Information concerning the use of the Libraries may be obtained at the Library service desks.

The Library is administered for the curricular, reference, and recreational needs and interests of the students. Instruction in the use of the library is given upon request by the reference librarians. The Library endeavors to assist students and all members of the University to use the rich library resources of Washington and the unusual opportunities they offer for extensive research. Interlibrary loan arrangements are maintained with other libraries in the city and in the United States.

The student has access to the Library of Congress, the Public Library of the District of Columbia and its branches, the libraries of the Pan American Union, the Bureau of Railway Economics, the U.S. Department of Agriculture, the Smithsonian Institution, the National Library of Medicine, and many of the other great special collections of the government departments. Doctoral students at George Washington University may, upon application to the Dean of the Graduate School of Arts and Sciences, be issued a Consortium library card which permits direct borrowing from the libraries of the other Consortium institutions.

The hours of the University Library are Monday through Friday, 8:30 a.m. to 12:00 midnight; Saturday, 9:00 a.m. to 10:00 p.m.; Sunday, 1:00 p.m. to 12:00 midnight. The Law Library is open Monday through Friday, 8:00 a.m. to 12:00 midnight; Saturday, 9:00 a.m. to 5:00 p.m.; and Sunday, 2:00 to 10:00 p.m. The Medical Library is open Monday through Friday, 8:30 a.m. to 10:00 p.m.; Saturday, 8:30 a.m. to 5:00 p.m.; Sunday, 12:00 to 5:00 p.m.

THE BOARD OF TRUSTEES OF THE UNIVERSITY

The President of the University is an ex officio member of the Board of Trustees.

Edward Karrick Morris, LL.D., *Chairman*
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* Nominated by the alumni.

TERM ENDING 1971

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TERM ENDING 1972

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 Lewis L. Strauss, Sc.D., LL.D., L.H.D.
 Alexander Wetmore, Ph.D., Sc.D.
 Lloyd Bennett Wilson

* Nominated by the alumni.

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The Chairman of the Board of Trustees and the President of the University are ex officio members of each committee of the Board.

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Mr. Phillips, <i>Vice Chairman</i>	Mr. Sullivan
Dr. Carmichael	Mr. Wilson
Mr. Jennings	Mr. Woodzell
Mr. C.D. Smith	

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Mr. Milbank, <i>Vice Chairman</i>	Dr. Ripley
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-
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 Rupert Woodward, B.S., B.S. in L.S., M.A., *Director of Libraries*

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- Calvin Darlington Linton, Ph.D., *Dean of Columbian College of Arts and Sciences*
 Arthur Edward Burns, Ph.D., *Dean of the Graduate School of Arts and Sciences*

* The President of the University, the Vice President for Academic Affairs, the Registrar of the University, and the Director of Admissions of the University are ex officio members of all faculties of the colleges and schools of the University.

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 Rodney Tillman, Ed.D., *Dean of the School of Education*
 James Carlton Dockeray, Ph.D., *Dean of the School of Government and Business Administration*
 Burton Malcolm Sapin, Ph.D., *Dean of the School of Public and International Affairs*
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 Ralph Clarke Nash, Jr., B.A., J.D., *Associate Dean of the National Law Center, for Graduate Studies, Research, and Projects*
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 Victor Frederick Ludewig, B.S., *Administrator of the University Hospital and Clinic*
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 Robert Edward Baker, M.A., Ed.D., *Assistant Dean of the School of Education*
 Blake Smith Root, M.A., Ed.D., *Assistant Dean of the School of Education*
 Jean Marie Gladding, M.A., *Acting Assistant Dean of the Division of University Students*
 Lawrence Winkler, B.S., M.A., Ed.D., *Assistant Dean of the Summer Sessions*
 Isabella Frances Young, B.A. in L.S., *Librarian of the Medical Library*
 Hugh Yancey Bernard, B.A., B.S. in L.S., J.D., *Librarian of the Law Library*

COMMITTEES OF THE UNIVERSITY 1969-70

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The Committee on Academic Policy, whose Chairman is the Vice President for Academic Affairs, is composed of the following members: the deans of the colleges, schools, and divisions; the Chairman of the Executive Committee of the University Senate; the Vice President and Treasurer; the Vice President for Development; the Vice President for Administration; the Vice President for Advanced Policy Studies; the Vice President for Student Affairs; the Assistant Vice President for Academic Affairs; the Assistant Vice President for Research; the Assistant Vice President (Office of the Treasurer); the Assistant Treasurer and Director, Office of Student Financial Aid; the Registrar; the Director of Admissions; the Director of the Budget; the Comptroller; the Director of Public Relations; the Associate Deans of Students; the Business Manager; the Director of Personnel Services; the Administrator of the University Hospital and Clinic; the Director of Libraries; the Director of the University Center; the Director of Men's Athletics; a representative of Student Government; and a student representative of Phi Beta Kappa.

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Harold Frederick Bright	Clarence Alfred Lowe
Alfred Martin Freudenthal	Ralph Elliott Purcell
Herman Hedberg Hobbs	Martha Norman Rashid

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Roland Richard Bonato	Ralph Kirby White
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Calvin Darlington Linton	

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Elyce Zenoff Ferster	Daniel David Roman
John Kaye	Carl James Lange, <i>ex officio</i>
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COMMITTEE ON STUDENT LIFE

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Frank Duane Allan	David Earl Seidelson
Hugh Linus LeBlanc	Paul Rogers Sherburne
Charles Rudolph Naeser	Seven Student Members

COMMITTEE ON STUDENT PUBLICATIONS

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Sam Clark Munson	Five Student Members
Richard Thornton	

COMMITTEE ON RELIGIOUS LIFE

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John Gordon Boswell	Howard Morley Sachar
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THE UNIVERSITY SENATE 1969-70

Galip Mehmet Arkilic	*Louis Harkey Mayo
John Withrow Brewer	John Andrew Morgan
*Harold Frederick Bright	Harry Robert Page
*Arthur Edward Burns	*John Parks
*Charles William Cole	Theodore Peter Perros
Raymond Sheary Cottrell, Jr.	Howard Clemeth Pierpont
Robert Emmet Cronin	Max Pock
Alton Harold Desmond	Martha Norman Rashid
*Lloyd Hartman Elliott	John Palmer Reesing, Jr.
Robert Norton Ganz, Jr.	David Robinson, Jr.
Lyndale Harpster George	Presson Scott Shane
William Byron Griffith	David James Sharpe
*Frederick Russell Houser	*William Parkhurst Smith, Jr.
Robert Gean Jones	†Edwin Lockwood Stevens
Norman Clifford Kramer	*Rodney Tillman
*Robert Kramer	George Vartkes Vahouny
Frederick Charles Kurtz	Reuben Esselstyn Wood
*Harold Liebowitz	Artley Joseph Zuchelli
*Calvin Darlington Linton	

Charles Kent Carlson, *Parliamentarian*

* *Ex officio* member.

† Chairman of the Executive Committee.

GENERAL INFORMATION

Admission

THE UNIVERSITY ACCEPTS BOTH MEN AND WOMEN. Students are admitted at the beginning of each semester and summer session.

The right is reserved to refuse admission to any student with an academic record which creates doubt of his ability to succeed in college or who, for any other reason, would not be an acceptable student.

An application for admission to degree candidacy should be accompanied by a \$25 application fee.* The application fee is waived for a student applying for readmission who was registered as a degree candidate at the time of his last registration at this University and has not since registered at another institution.

Applicants are urged to submit the application form and complete credentials well in advance of the semester for which they seek admission.

Records presented become the property of the University and *cannot* be returned.

UNDERGRADUATE ADMISSION†

Forms for application for admission or readmission are available at and should be returned to the Office of Admissions, George Washington University, Washington, D.C. 20006.

SECONDARY SCHOOL STUDENTS

Regular Admission.—Applicants for regular admission who wish to begin college in the fall semester *should* apply during the fall term of the senior high school year, *and* no later than March 1. Students graduating at mid-term wishing to begin college in the spring semester *must* apply no later than December 1. Applications and all required credentials of students wishing to begin college in either the first or second term of the summer session *must* be received prior to March 1.

An applicant from a secondary school must arrange to have sent directly from his school to the Office of Admissions a complete academic record together with a personal evaluation and recommendation from his principal. This

* Application fee must be by check or postal money order, payable to George Washington University.

† For detailed admission requirements, see the appropriate college or school in this Catalogue. Tests required for admission and Educational Testing Service information are described on page 72. See pages 26-27 for admission requirements for students from foreign institutions.

information may be supplied on a form provided by the University or on a standard form used by the secondary school, provided all essential information is included.

Early Decision Plan.—For the qualified student who wants to begin college in the fall semester and receive an early notice of acceptance, the University offers an early decision plan. The student need *only* indicate on the application form that he wishes an early decision and have all required credentials in the Office of Admissions prior to November 1. A decision will be mailed by December 15. The declaration of intent to attend the University and a \$200 tuition deposit (plus an additional \$200 housing deposit for resident students), non-refundable *must be submitted by January 15 to reserve space.*

If the applicant is accepted under the early decision plan but fails to submit the deposit by January 15, he will be reconsidered, along with all other applicants, for regular admission, as described above.

TRANSFER STUDENTS

Undergraduate transfer students from other institutions *must* submit application and required credentials prior to June 1 for the fall semester, December 1 for the spring semester, May 1 for the first summer session, and June 1 for the second summer session.

The transfer student must be in good standing as to scholarship and conduct. He must be eligible to return to the last previously attended institution in the semester for which he seeks admission to this University.

An applicant who has attended one or more institutions of higher learning must request *each* registrar to mail directly to the Office of Admissions a transcript of his record, *even though credits were not earned.*

If high school units are not shown on the college transcript, the applicant should request his high school to submit a transcript to the Office of Admissions.

If an applicant has fewer than 30 semester hours of acceptable work (C or better on academic work from an accredited institution at the time the application is submitted), he must request that his high school record and College Entrance Examination Board test scores be sent to the Office of Admissions.

TUITION DEPOSIT

Upon notification of acceptance, a \$100 tuition deposit (\$200 for students admitted by "Early Decision Plan," see above) will be required of all full-time undergraduate students including those readmitted. The deposit is credited toward tuition and is not refundable.

ADVANCED STANDING

CREDIT FOR ADVANCED PLACEMENT EXAMINATIONS

Up to 30 semester hours of credit may be granted for college-level courses in an approved secondary school, if substantiated by satisfactory performance in the appropriate Advanced Placement Examination of the College Entrance Examination Board. Arrangement for the examination is the responsibility of the applicant and should be made with the College Board Advanced Placement Examinations, Box 977, Princeton, N.J. 08540.

Credit is assigned for examinations with scores of 4 or 5 on the basis of a score report from the Educational Testing Service. This report must be requested by the student. Examinations with grades of 3 will be given consideration for possible placement and/or credit if the student arranges to have the examination paper sent to the Office of Admissions at this University.

CREDIT FROM HIGHER INSTITUTIONS

Advanced standing may be granted for work successfully completed at accredited institutions of higher learning. Credit will be granted for transferred work only when it meets the requirements for the degree sought at this University. It may be allowed provisionally. Work of low pass grade (*D* or the equivalent) will not be considered for transfer.

SERVICE SCHOOL CREDIT

A limited amount of credit earned in service schools since 1941 may be considered for assignment to qualified degree candidates. Veterans should submit to the Office of Admissions photostatic copies of their service school records, indicating courses successfully completed with sufficient identification of the course to locate it in the *Guide to Evaluation of Educational Experience in the Armed Forces*.

GRADUATE ADMISSION*

Graduate School of Arts and Sciences.—Forms for application for admission or readmission are available at the Office of the Dean of the Graduate School of Arts and Sciences, George Washington University, Washington, D.C. 20006. When completed, these application forms should be submitted to this Office, together with college transcripts and letters of reference, no later than February 15 for the fall semester and November 1 for the spring semester.

School of Education.—Forms for application for admission or readmission are available at the Office of the Dean of the School of Education, George Washington University, Washington, D.C. 20006. When completed, these application forms should be submitted to this Office no later than July 1 for the fall semester, December 1 for the spring semester, May 1 for the first summer session, and June 1 for the second summer session.

School of Government and Business Administration.—Forms for application for admission or readmission are available at the Office of the Admissions Officer, School of Government and Business Administration, George Washington University, Washington, D.C. 20006. When completed, these application forms should be submitted to this Office no later than July 1 for the fall semester, December 1 for the spring semester, May 1 for the first summer session, and June 1 for the second summer session.

School of Public and International Affairs.—Forms for application for admission or readmission are available at the Office of the Dean of the School of Public and International Affairs, Building T, George Washington University, Wash-

* For detailed admission requirements, see the appropriate college or school in this Catalogue. See pages 26-27 for admission requirements for students from foreign institutions.

ington, D.C. 20006. When completed, these application forms should be submitted to this Office no later than June 1 for the fall semester, December 1 for the spring semester, May 1 for the first summer session, and June 1 for the second summer session.

DIVISION OF UNIVERSITY STUDENTS ADMISSION*

Forms for application for admission to *nondegree* status in the Division of University Students are available at and should be returned to the Office of Admissions, George Washington University, Washington, D.C. 20006. When completed, these application forms, with credentials when required, should be received by the Office of Admissions no later than the Friday before the first day of registration (see Calendar, pages 7-9). No application fee is charged for admission to this Division. For detailed entrance requirements, see page 168.

Registration in a given course may be denied students in this Division when space is needed for degree candidates.

READMISSION

A student previously registered in the University who was not registered on campus during the immediately preceding semester (summer session excluded) must apply for readmission. Final dates for applying are the same as those for "Undergraduate Admission" (see pages 23-25), or "Graduate Admission" (see pages 25-26). If he applies as a degree candidate and was previously registered as a nondegree student, or if he has attended one or more higher institutions during his absence from the University, he must have complete official transcripts sent to the appropriate office at this University from each institution attended. Applications for readmission are considered on the basis of regulations currently effective.

The application fee is waived for a student applying for readmission who was registered as a degree candidate at the time of his last registration at this University and has not since registered at another institution.

STUDENTS FROM FOREIGN INSTITUTIONS†

Application, required records, and scores on the *Test of English as a Foreign Language* (see page 27) must be received from *foreign applicants* no later than March 1 for the fall semester and November 1 for the spring semester.

REQUIRED RECORDS

Applicants must request all educational institutions attended to send *directly* to the appropriate office (see "Undergraduate Admission," pages 23-25, or "Graduate Admission," pages 25-26) official credentials listing subjects studied, grades

* See this page for admissions requirements for students from foreign institutions.

† For detailed admission requirements, see the appropriate college or school in this Catalogue. Tests required for admission and Educational Testing Service information are described on pages 72 and 168.

received, examinations taken, and degrees received. Certified copies of diplomas and certificates from secondary schools and all colleges and universities attended are required. Records of state examinations and certificates are also needed. All records become the property of the University and *cannot* be returned.

LANGUAGE TEST

Students whose native tongue is not English are required to take the *Test of English as a Foreign Language*. Students are responsible for making arrangements for taking the test and should address inquiries to: TOEFL, Educational Testing Service, Princeton, New Jersey 08540, U.S.A. The completed application form should be returned to the Testing Service at Princeton well in advance of the beginning of the semester for which the applicant seeks admission. The test fee, which should be remitted with the application, entitles the student to have his test score sent to three different institutions. Registration for the *Test of English as a Foreign Language* does *not* constitute application for admission to George Washington University.

The Bulletin of Information, obtainable without charge, contains a description of the test as well as rules regarding application, fees, reports, and the conduct of the test; lists of examination centers; examination dates; and an application blank. On the application for the test, the student should specify that the scores be sent to the appropriate office at this University (see "Undergraduate Admission," pages 23-25, or "Graduate Admission," pages 25-26).

If additional tests are prescribed, necessary instructions will be sent to the applicant.

TRANSFER WITHIN THE UNIVERSITY

For information concerning transfer from one college, school, or division to another within the University, see pages 46-47.

Registration

THE DATES, HOURS, AND PLACE OF REGISTRATION will be stated in the *Schedule of Classes*, which is available well in advance of each semester.

A student cannot register for classes until he has received a letter of admission to the University issued by the appropriate admitting office.

No registration is accepted for less than a semester or one summer session.

A student may not register concurrently in this University and another institution without the prior permission of the dean of the college, school, or division in which he is registered in this University. Registration in more than one college, school, or division of the University requires the written permission of the deans concerned, *prior to registration*. Allowance of credit for work done concurrently at another institution is at the discretion of the appropriate committee.

ELIGIBILITY FOR REGISTRATION

Registration for the following categories of campus students is held on the day of registration stated in the University Calendar. No student who is suspended or whose record is not clear for any reason is eligible to register. Registration in a given course may be denied students in the Division of University Students when space is needed for degree candidates.

New Student.—Upon receipt of a letter of admission, the new student is eligible for registration on the stated days of registration.

Readmitted Student.—A student previously registered in the University who was not registered for campus courses during the preceding semester or summer session must apply for and receive a letter of readmission from the appropriate admitting office before he is eligible for registration. A student registered for the spring semester of 1970 need not apply for readmission for the fall semester of 1970-71. Such a student is a "Continuing Student."

Continuing Student.—The student registered for campus courses in the immediately preceding semester of the academic year is eligible to register upon presentation of his student identification card from the previous semester. The student registered for the 1970 Summer Sessions campus courses, and not restricted to summer registration, is eligible to register for the 1970-71 fall semester on presentation of his 1970 Summer Sessions student identification card.

REGISTRATION CHANGES AND WITHDRAWALS (see pages 32-33, 46-47)

REGISTRATION BY GW STUDENTS FOR CONSORTIUM COURSES

Students interested in taking courses at any of the four other universities in the Consortium of Universities of the Washington Metropolitan Area, Inc. (see page 51), should consult the program announcements of the other universities. Consortium application forms and instructions are available from the Registrar after the student has obtained his registration packet. In order to participate in the Consortium program (1) the graduate student must obtain the approval of his adviser and should ascertain from the department of the university where the course is taught whether or not he is eligible for the course and whether there is a space in the class or (2) the undergraduate student must obtain the approval of his adviser and must ascertain from the department of the university where the course is taught whether or not he is eligible for the course and whether there is space in the class. Specific inquiries should be addressed to the Registrar.

Fees and Financial Regulations

FEES PAID BY STUDENTS cover only a portion of the cost of the operation of the University. Income from endowment funds, grants, and gifts from alumni and friends of the institution make up the difference.

The following fees and financial regulations were adopted for the academic year 1970-71. (See page 31 for projected tuition increases for 1971-74.)

Tuition Fees

For undergraduate study in Columbian College of Arts and Sciences, the School of Education, the School of Government and Business Administration, the School of Public and International Affairs; for study in the Division of University Students; and for courses taken on campus by undergraduate students in the College of General Studies:

Full-time program (12 to 18 hours), each semester.....	\$950.00
Part-time program or hours in excess of 18, for each semester hour.....	68.00

For graduate study* in the Graduate School of Arts and Sciences, the School of Education, the School of Government and Business Administration, and the School of Public and International Affairs; and for courses taken on campus by graduate students in the College of General Studies (Exception: doctoral students registered prior to July 1, 1967, who wish to continue payments according to the plan (see below) in effect prior to that date):

For each semester hour for which a student registers.....	68.00
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For students registered for doctoral degrees† in the Graduate Council (now the Graduate School of Arts and Sciences) and the School of Government and Business Administration prior to July 1, 1967, who wish to continue payments according to the plan in effect prior to that date:

For work leading to and including the general examination.....	1,900.00
For work leading to and including the final examination.....	1,900.00

For students registered for the Doctor of Education degree‡ prior to July 1, 1967, who wish to continue payments according to the plan in effect prior to that date:

For work leading to and including the major field examination.....	2,375.00
For work leading to and including the final examination.....	1,425.00

University Center Fee (charged all students registered on campus, \$ nonrefundable)

For students registered for 11 or more semester hours on campus:

Each semester	37.50
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For students registered for less than 11 semester hours in a semester on campus:

For each semester hour for which the student registers.....	3.50
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For students maintaining "continuous registration" status:

Each semester	3.50
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* Payment of tuition for a Master's thesis entitles the candidate, during the period of registration, to the advice and direction of the member of the faculty under whom the thesis is to be written. In case a thesis is unfinished, additional time may be granted in accordance with the regulations of the school in which the student is registered.

† The tuition fee is to be paid at the rate of \$475.00 a semester or in full at the beginning of each stage of the doctoral discipline. No "continuous registration" fee will be charged if a third year is needed for completion of either part of the degree requirements. If still more time is needed, the student must maintain continuous registration and pay the continuous registration fee.

‡ As long as there is an unpaid balance for the part of the program on which the student is working, he must make at least the minimum tuition payment of \$237.50 at each fall and spring registration (and for any summer session in which he registers for academic work).

§ If the total fee is paid for the part of the program on which the student is working, he may continue to register, without additional fee, for courses approved by his Master in Research, until the expiration of the time allowed for that part of his program.

¶ Students in the College of General Studies are charged the University Center Fee only when registered for courses on campus.

Additional Course Fees

In certain courses additional fees, such as laboratory and material fees, are charged as indicated in the course descriptions. These fees are charged by the semester and, unless otherwise indicated, may be defrayed in two payments when the tuition is paid in this manner. Breakage of apparatus is charged against the individual student. When breakage is in excess of the normal amount provided for in the laboratory fee, the individual student will be required to pay such additional charges as are determined by the department concerned.

Graduation Fees

Associate in Arts.....	\$10.00
Bachelor's, Master's, Education Specialist, Doctor's degrees.....	25.00
Certificate of the Institute for Sino-Soviet Studies, Graduate Certificate in Health Care Administration.....	25.00
Fee for Binding Master's Thesis	10.00
Fee for Microfilm Service and Printing Abstract of Doctoral Dissertation	55.00

Residence Hall Fees (see page 56)**Special Fees**

Application fee (degree candidate), nonrefundable.....	25.00
Tuition deposit, nonrefundable:	
Charged each entering or readmitted full-time undergraduate student, except early decision freshmen.....	100.00
Charged each freshman admitted by the early decision plan.....	200.00
Application for room reservation, nonrefundable:	
Charged each resident student except early decision freshmen.....	100.00
Charged each student admitted by the early decision plan.....	200.00
Admission tests (when required).....	6.00-12.00
National Teacher Examinations fee, for Bachelor of Arts in Education degree candidates	9.00-13.00
Late-registration fee, for failure to register within the designated period....	15.00
Service fee, for deferred payment plan (see "Payment of Fees," pages 31-32)	5.00
Reinstatement fee, for reinstatement after financial suspension for nonpayment of fees.....	15.00
Returned check fee, charged a student whose check is returned because of insufficient funds or improper drafting.....	15.00
Continuous Registration fee, to maintain "continuous registration" status during any semester of absence from the University or after completion of tuition requirements*—due and payable on the official days of registration	68.00
For special physical examination.....	2.00
For each examination to qualify for advanced standing and for each special examination	5.00
English test for foreign students (when required).....	5.00

* Payment of the continuous registration fee entitles the student who is granted leave of absence to return and continue his work toward a degree under the academic requirements which were in force at the time of his first registration. The continuous registration fee applies toward neither tuition fee nor residence requirements for the degree.

This fee does not apply to students granted military leave, see pages 47-48.

Laboratory checkout fee, for failure to check out of Chemistry laboratory by the date deadline set by the instructor*	\$3.00
Transcript fee, for each transcript of record.....	1.00

Registration for on-campus courses in the University entitles each student to the following University privileges: (1) the services of the Student Career Services Office; (2) the use of the University Library; (3) gymnasium privileges; (4) admission to all athletic contests, unless otherwise specified; (5) subscription to the *University Hatchet*, the student newspaper; (6) admission to University debates; (7) medical attention and hospital services as described under Health Services. These privileges terminate when the student withdraws or is dismissed from the University.

PROJECTED TUITION INCREASES 1971-74

In order that students and their parents may plan more realistically for a total four-year period, tuition increases for the academic years 1971-72, 1972-73, and 1973-74 have been estimated as follows:

Increase by year (full-time undergraduate students):	
1971-72	\$150.00
1972-73	150.00
1973-74	150.00
Increase by semester hour (graduate and part-time undergraduate students):	
1971-72	6.00
1972-73	6.00
1973-74	6.00

Every effort will be made to keep tuition increases within the above limits. However, it is not possible to project future economic data with certainty, and circumstances may require an adjustment in these estimates.

PAYMENT OF FEES

All fees are payable at the Office of the Cashier. Checks and postal money orders should be made out to George Washington University. No student is permitted to complete registration or attend classes until all fees are paid.

Tuition and fees for each semester are due and payable in full at the time of each registration.

The Student Accounts Office has responsibility for creating, billing, and maintaining student accounts resulting from tuition and room and board charges. A student registered for six semester hours or more may sign a contract with this Office at the time of each registration permitting him to pay one-half of the total tuition and fees (except for fees payable in advance) at the time of registration and the remaining half on or before November 4, 1970 (for the fall semester) and March 17, 1971 (for the spring semester). A service fee of \$5 will be charged for the use of this deferred payment plan. The University will not obligate itself to notify the student, in advance, of the payment-due date for the second half of the semester charges. Students who fail to make any payment when due will be automatically suspended and may not

* A student who drops a Chemistry course before the end of the semester must check out of the laboratory at the next regular laboratory period.

attend classes until they have paid all accrued fees and the \$15 reinstatement fee and have been officially reinstated by the Student Accounts Office.

A student suspended for failure to meet payments when due may not be reinstated for the semester after two weeks from the date of suspension. Applications for reinstatement are to be made to the Student Accounts Office.

An auditor pays all fees chargeable to the student registered for credit.

Because many parents may wish some option in meeting and financing all or part of the cost of a college education, the University offers educational loan plans through the Girard Trust Exchange Bank in Philadelphia, Pennsylvania; Funds for Education, Inc., Manchester, New Hampshire; and The Riggs National Bank, Washington, D.C.

Although similar in purpose, these plans vary somewhat in coverage and conditions. One-year and multiple-year plans are available. Insurance covering the life and health of the sponsor is provided through these plans.

Individuals over twenty-one years of age who are employed full-time are also eligible to apply. They may sponsor their own contracts, provided they meet the conditions specified by the plan for which they are applying.

Brochures and applications describing these plans are available in the Office of Student Financial Aid.

WITHDRAWALS AND REFUNDS

Applications for withdrawal from the University or for change in class schedule must be made in person or in writing to the dean of the college, school or division in which the student is registered. Notification to an instructor is not an acceptable notice (see "Withdrawal," page 46).

In authorized withdrawals and changes in schedule, cancellations of semester tuition charges and fees will be made in accordance with the following schedule:

1. Complete withdrawal from the University:

FALL SEMESTER

Withdrawal dated on or before September 25, 1970.....	90 per cent
Withdrawal dated September 28 to October 9, 1970.....	75 per cent
Withdrawal dated October 12 to October 23, 1970.....	50 per cent
Withdrawal dated after October 23, 1970	none

SPRING SEMESTER

Withdrawal dated on or before February 5, 1971.....	90 per cent
Withdrawal dated February 8 to February 19, 1971.....	75 per cent
Withdrawal dated February 22 to March 5, 1971.....	50 per cent
Withdrawal dated after March 5, 1971.....	none

- For a change in status from full-time to part-time student or for partial withdrawal by a part-time student, the above schedule applies to the difference in charges between the original program and the adjusted program continuing in effect.

3. A student enrolled in a full-time program who drops or adds a course and continues to be in a full-time program will have no financial adjustments of tuition made other than those involving course fees.
4. A student who is granted military leave before completing the semester will receive credits for current charges in accordance with the schedule for complete withdrawal from the University (see No. 1 above). Payments made in excess of the nonrefundable balance will be maintained as a deferred credit for use by the student when he returns to the University (see "Military Leave," pages 47-48).
5. Regulations governing student withdrawals as they relate to residence hall and food service charges are contained in the specific lease arrangements.

In no case will tuition be reduced or refunded because of absence from classes. Payment applies only to the semester for which a registration charge is incurred and will not be credited to another semester (exception: students granted military leave, see pages 47-48).

Authorization to withdraw and certification for work done will not be given student who has not a clear financial record.

Students are encouraged to provide their own cash funds until they can make banking arrangements in the community.

Financial Aid

FOR UNDERGRADUATE STUDENTS*

GEORGE WASHINGTON UNIVERSITY has a program of financial assistance for undergraduate students of scholarships, loans, grants, part-time employment, or any combination of these resources. The University participates in the National Defense Student Loan, Educational Opportunity Grant, and College Work-Study programs. Financial aid is awarded on the basis of the student's scholastic record, financial need, and qualities of leadership and character.

Scholarships are awarded for the academic year.

Applications and supporting credentials for financial aid must be filed by February 1 (entering freshmen), March 1 (enrolled undergraduate or entering transfer students) preceding the academic year of the award for the fall semester; by October 31, for the spring semester; and by May 1, for the summer session†.

An undergraduate transfer student is not eligible for scholarship funds until the academic year following completion of one full semester (15 hours) at this University with a superior academic record. A transfer student is, however, immediately eligible for other types of financial aid.

Complete information concerning financial assistance is contained in the pamphlet "Student Financial Aid," which is available at the Office of Student Financial Aid, George Washington University, Washington, D.C. 20006.

*For information concerning financial aid for students from foreign countries, see page 39.
 †A Summer Sessions student is eligible for consideration only if he is enrolled in this University at least 8 semester hours in the immediately preceding spring semester or has applied for financial aid for the following fall semester.

The following scholarships are available to students in Columbian College of Arts and Sciences, the Graduate School of Arts and Sciences, the School of Education, the School of Government and Business Administration, and the School of Public and International Affairs. The University also offers many other scholarships which are available to students in these colleges and schools.

The George Washington University Board of Trustees Scholarships.—Full and partial-tuition scholarships, which will begin in the fall semester and extend for four successive academic years, provided the holder maintains a superior academic record, as well as a high standard of deportment, and continues to be in financial need. Candidates must plan to select a curriculum leading to a Bachelor's degree in any school of the University, except the College of General Studies. Students who have demonstrated outstanding ability in interscholastic speech and debate activities are eligible for the George F. Henigan Scholarships in Debate which are included among these scholarships.

SCHOLARSHIPS

Sherman Page Allen Memorial Scholarship Fund (1966)

Alumni Scholarships

Mary J. Anderson Scholarship (1969)

Byron Andrews Scholarship (1920)

Beta Sigma Phi Scholarship (1962)

Henry N. Brawner, Jr., Foundation Scholarship Fund (1963)

Emma K. Carr Scholarships (1932)

Maria M. Carter Scholarship (1871)

Paul E. Casassa Memorial Foundation Scholarship (1968)

Chi Omega Alumnae Scholarship (1966)

Colortone Graphic Arts and Publications Scholarship (1961)

Columbian Women Scholarship Funds

Victoria Briggs Scholarship Fund (1959)

Elizabeth V. Brown Scholarship Fund (1925)

Grace Ross Chamberlin Scholarship Fund (1932)

College Women's Scholarship Fund (1926)

Columbian Women Members' Scholarship Fund (1961)

Arline Hughes Dufour Scholarship Fund (1961)

Dr. Watson W. Eldridge, Jr., and John F. Eldridge Scholarship Fund (1964)

Founders of Columbian Women Scholarship Fund (1920)

Rose Lees Hardy Foundation Scholarship Fund (1957)

Lillian Young Herron Scholarship Fund (1925)

Nellie Maynard Knapp Scholarship Fund (1915)

Marcia B. Kraft Scholarship Fund (1966)

Janet McWilliams Scholarship Fund (1954)

Marie-Louise Ralph Turner Scholarship Fund (1963)

Daughters of the American Revolution Scholarship (1952)

Isaac Davis Scholarship (1869)

District of Columbia Institute of Public Accountants Scholarship (1964)

Estella Constance Drane Scholarship (1957)

Robert Farnham Scholarship (1871)

Federal Government Accountants Association of Washington, D.C., Scholarship

Esther Brigham Fisher Scholarship (1951)

Foreign Student Scholarships (see page 39)

Friendship Business and Professional Women's Club Scholarship (1967)
 General Motors College Scholarship (1955)
 Georgetown Business and Professional Woman's Club Scholarship (1958)
 Giant Food, Inc., Scholarship Intern Program
 Mildred Green Memorial Scholarship Fund (1959)
 Anna Spicker Hampel Scholarship (1949)
 Julian O. Hargrove Scholarship (1968)
 Elma Lewis Harvey Scholarship (1921)
 Hazleton Scholarship (1950)
 George F. Henigan Scholarships in Debate (1967)
 Jewish War Veterans' Auxiliary Scholarship (1964)
 David B. and James L. Karrick, Jr., Scholarship Fund (1968)
 Samuel and Elizabeth Kay Scholarship (1969)
 Amos Kendall Scholarship (1869)
 L. Poe Leggette Memorial Scholarship Established by WRGW (1968)
 Eugene and Agnes E. Meyer Scholarships (1952)
 Mitchell-Stancioff Scholarship (1967)
 A. Morehouse Scholarship (1861)
 Helen Marie and Thomas E. Orr Scholarships (1965)
 Fred B. and Alma D. Pletcher Scholarship Fund (1968)
 Levin M. Powell Scholarships (1886)
 Phi Delta Gamma Scholarship (1956)
 Research Assistantships in Operations Research and Related Fields (see page 36)
 Henry Whitefield Samson Scholarship Fund (1966)
 Lula M. Shepard Scholarships (1946)
 Sigma Delta Chi Foundation of Washington, D.C., Scholarships
 David Spencer Scholarship (1918)
 Mary Lowell Stone Scholarship (1893)
 Charles Clinton Swisher Scholarships (1941)
 Tau Kappa Epsilon Scholarship (1959)
 U.S. Office of Education Traineeships (1964)
 University Hospital Scholarships in Medical Technology
 University Players Scholarship in Memory of L. Poe Leggette (1968)
 University Women's Club, Inc., Memorial Fund Scholarship (1967)
 William Walker Scholarship (1824)
 Abigail Ann Brown and Henry Kirk White Scholarship Fund (1963)
 John Withington Scholarship (1830)
 Women's Physical Education Alumnae Association Scholarship (1964)
 William G. Woodford Scholarship (1969)
 Ellen Woodhull Scholarship (1919)
 Zonta Club Scholarship (1950)

GRANTS

The following funds have been established to meet the special needs of disadvantaged students from the District of Columbia Inner-City and the Washington Metropolitan area.

Educational Opportunity Grants
 Educational Opportunity Program Tuition Grants (1968)
 Marriott Corporation Grant (1968)
 Walt Whitman High School Key Club Grant (1968)

FOR GRADUATE STUDENTS*

The George Washington University program of financial assistance for graduate students includes assistantships, fellowships, traineeships, graduate scholarships, research appointments, part-time employment, and loans. Application for admission to graduate study is a prerequisite for consideration. The University participates in the National Defense Student Loan and College Work-Study programs.

Application and correspondence concerning assistantships, fellowships, traineeships, or graduate scholarships should be sent directly to the dean of the school concerned, and addressed to George Washington University, Washington, D.C. 20006. Unless otherwise specified, application and supporting credentials should be submitted no later than February 1 preceding the academic year for which the award is made.

A separate application for National Defense Student Loans or the College Work-Study Program must be submitted to the Office of Student Financial Aid by April 1 for the following academic year.

ASSISTANTSHIPS

Research Assistantships in Operations Research and Related Fields.—Available to graduate students, juniors, and seniors, in any college or school of the University. Research Assistants are expected to work 20 hours a week conducting research in support of an established research program, in programming or in conducting individual research on an approved research project. Stipends vary from \$3,124 to \$6,449, depending on the status of the student and the length of the appointment (9–12 months). Applications must be received prior to March 1. Further information and applications are available from the Director, Institute for Management Science and Engineering, Staughton Hall, 707 Twenty-second Street, N.W., Washington, D.C. 20037.

Resident Assistantships (men and women).—Available to graduate students and seniors in any field of study who are interested in working with the student personnel program in University residence halls. Specific duties vary with the position, but basically consist of counseling, advising student groups, and administration. Remuneration includes full tuition and a furnished room for the academic year. All positions are part-time, enabling staff members to enroll as full-time students. Application should be completed before March 1. Further information may be obtained from the Office of the Associate Dean of Students for residence halls and counseling.

Urban Affairs Graduate Assistantship in Political Science.

FELLOWSHIPS, INTERNSHIPS, TRAINEESHIPS

The following fellowships, internships, and traineeships are available to students in the Graduate School of Arts and Sciences, the School of Education, the School of Government and Business Administration, and the School of Public and International Affairs. The University also offers many other fellowships which are available to students in these colleges and schools. Complete information is contained in the pamphlet "Student Financial Aid," which is available at the Office of Student Financial Aid, George Washington University, Washington, D.C. 20006.

* For information concerning financial aid for students from foreign countries, see page 39.

Graduate Teaching Fellowships.—Available to graduate students in Master's and doctoral programs in most departments of the University. Each teaching fellow renders a designated unit of service to his major department of instruction and receives a stipend of up to \$2,800 (on a 9-month basis), plus tuition and additional course fees.

Research Traineeships.—Available under numerous sponsored programs in a number of departments. Currently, the basic medical science departments and the departments of Psychology and Speech and Drama offer these programs. Stipends vary; information is available from the departments and the Dean's Office of the Graduate School of Arts and Sciences.

American Civilization Fellowships

American Civilization Internships (Smithsonian Institution-George Washington University Cooperative Program)

Arlington County-George Washington University Cooperative Internship Program

Winfield Scott Blaney Fellowship in International Affairs (1961)

Thomas Alva Edison Fellowship

Elementary Teacher Education Internships

Foreign Student Fellowships (see page 39)

W.K. Kellogg Foundation Fellowships (1964)

Isabella Osborn King Research Fellowships (1927)

Loula D. Lasker Fellowships in Housing, City Planning, or Urban Renewal Mellon Fellowships

National Defense Education Act Fellowships

National Endowment for the Humanities Fellowships

National Historical Publications Commission-George Washington University Cooperative Research Fellowships

National Science Foundation Graduate Fellowships

National Science Foundation Graduate Traineeships

Rose Bibliography Internships

Thomas Bradford Sanders Fellowships (1928)

Scottish Rite Fellowships

Special Graduate School of Arts and Sciences Fellowships

U.S. Office of Education Fellowships (1964)

U.S. Public Health Service Predoctoral Fellowships

U.S. Public Health Service Traineeships

Urban Studies Fellowships of the Department of Housing and Urban Development

Urban Transportation Center Fellowships

GRADUATE SCHOLARSHIPS

Emma K. Carr Scholarships (1932)

Paul H. and Margaret M. DeMaine Scholarships (1967)

Gamma Phi Beta Sorority Scholarships (1962)

Frederick H. Gibbs Scholarship Fund-Health Care Administration (1967)

Kappa Kappa Gamma Scholarship (1969)

Mitchell-Stancioff Scholarship (1967)

Paul Pearson Scholarship Fund (1940)

Phi Delta Gamma Scholarship Fund (1968)

Voorhees Scholarships

Wolcott Foundation Scholarships

SPONSORED AWARDS FOR GRADUATE STUDY

General information regarding awards sponsored by foundations, professional and learned societies, industries, and others which may be used in support of graduate study is available at the Fellowship Information Center in the Graduate School of Arts and Sciences for students enrolled at George Washington University. Information is available on the prestige programs such as the Rhodes, Marshall, Woodrow Wilson, Fulbright, Rotary International, and Danforth, as well as many others.

As deadlines for application vary, qualified students should make inquiries well in advance of the year of planned graduate study.

LOAN FUNDS

The following loan funds are available to undergraduate and/or graduate students in Columbian College of Arts and Sciences, the Graduate School of Arts and Sciences, the School of Education, the School of Government and Business Administration, and the School of Public and International Affairs. Complete information is contained in the pamphlet "Student Financial Aid," which is available in the Office of Student Financial Aid, George Washington University, Washington, D.C. 20006.

American Medical Association Nursing Home Administration Loan Fund

Foreign Student Loan Funds (see page 39)

W.K. Kellogg Foundation Hospital Administration Loan Fund

Long-term Care Loan Fund

Jessie B. Martin Loan Fund (1967)

National Defense Education Act Student Loan Program

Short-term Foreign Student Loan Fund (1967)

State Guaranteed Loan Program

Ellis Stearman Emergency Loan Fund

U.S. Loan Program for Cuban Students

United Student Aid Fund Loan

University Student Emergency Loan Fund

STUDENT EMPLOYMENT

The Student and Alumni Career Services Office maintains a registry of both full-time and part-time positions available in the Washington area for undergraduate and graduate students.

After registering, students may apply at the Student and Alumni Career Services Office, Woodhull House, 2033 G Street, N.W., for interviews and referrals to positions for which they are qualified.

FOREIGN STUDENTS

Undergraduate foreign students with proven financial need who have completed one semester of full-time work (15 hours) at this University with a superior academic record are eligible for consideration for the Board of Trustees Scholarships. Scholarships are awarded in the spring for the following academic year. See instructions for applying for undergraduate financial aid, page 33.

Limited awards for graduate teaching fellowships are the responsibility of the chairman of the department or dean of the school in which the degree is to be earned. Work as a teaching fellow requires excellent knowledge of English—both spoken and written.

Long-term loan funds for undergraduate and graduate foreign students are limited in amount and are available only to those foreign-born persons who have established resident status in the United States through the Immigration and Naturalization Service.

We suggest that students who wish to study in the United States have available sufficient funds to cover expenses for one full year before attempting to enter a college or university. The cost at this University for one academic year (September–June) is approximately \$4,100. This estimate includes room and board, tuition, books, clothes, and incidental expenses; no travel, holiday, or medical expenses are included.

LAW ENFORCEMENT EDUCATION PROGRAM

This program of grants and loans, which was authorized under the provisions of the Omnibus Crime Control and Safe Streets Act of 1968, is intended to help pay the cost of tuition, fees, books, and other education expenses of officers who are employed by publicly funded law enforcement or correctional agencies. Both graduate and undergraduate studies are included and may be full- or part-time in a wide range of subject areas and degree goals. Priority will be given to law enforcement and correctional officers who are employed on the city, county, or state level. Applications are available in the Office of Student Financial Aid.

Prizes

Alpha Chi Sigma Prizes.—A *Handbook on Chemistry and Physics* awarded annually by Alpha Pi Chapter to each of three students who carry at least 18 semester hours during the freshman year and attain the highest averages in freshman chemistry.

The name and year of graduation of the student who has attained the highest academic record in courses in chemistry is inscribed on a bronze plaque. The winner must have had at least 16 hours in chemistry including the final semester at this University.

Alpha Delta Pi Prize.—Offered annually by Alpha Pi Chapter to the woman in the junior class with the most outstanding record in scholarship, extracurricular activities, and service to the University.

Alpha Kappa Psi Prize.—A key, awarded annually by Beta Mu Chapter to the male student who has completed 90 semester hours at this University and

attained the highest average grade in business administration, economics, international business, public accounting, and public finance. The name of the winner and the year of the award is engraved on a plaque in the Office of the Dean of the School of Government and Business Administration.

American Institute of Chemists Prize.—A medal and a one-year subscription to *The Chemist* awarded annually to the graduating student majoring in chemistry who excels in scholarship, integrity, and leadership.

The Walter G. Bryte, Jr., Achievement Award.—Provided by Walter G. Bryte, Jr., Colonel, U.S. Air Force (retired), first Professor of Air Science at George Washington University. The award is presented annually primarily to that undergraduate residence hall, secondarily to any other activity at the University, which has shown, under the leadership of its elected or designated head, the most improvement or excellence in its support of the principles and aims of the United States of America and George Washington University. The hall or other activity will be awarded a cash prize, and the name of its leader and his hall or activity will be engraved on a silver trophy.

Byrne Thurtell Burns Memorial Prize.—Awarded to the senior majoring in chemistry who shows the greatest proficiency in organic chemistry, as evidenced by a comprehensive examination, and who possesses such qualifications of mind, character, and personality as to give promise of future achievement.

Wilbur J. Carr Prize.—Established in 1962 by Edith K. Carr, former Trustee of the University, in memory of her distinguished husband, who was graduated from the School of Comparative Jurisprudence and Diplomacy in 1899. It is awarded annually to that man in the graduating class of the University who has demonstrated outstanding ability in his study of international affairs and who has given evidence of possessing in marked degree the qualities which produce the good citizen and the dedicated public servant.

The Chemical Rubber Co. Freshman Chemistry Achievement Prize.—A *Handbook of Chemistry and Physics* awarded annually to the freshman student who has demonstrated the greatest achievement in Chemistry 15-16.

Chi Omega Prize.—Awarded annually by Phi Alpha Chapter to the woman in the graduating class with the highest record in economics, sociology, political science, and history; combined with general excellence.

The Columbian Women Prize.—Awarded to the senior woman who in her undergraduate life has most nearly fulfilled the objectives of Columbian Women.

Ernest Connolloy Memorial Prize.—Awarded by the Washington Personnel Association. Offered every third year to an outstanding graduating senior in business administration who shows general excellence in studies, demonstrates superiority in one or more courses in personnel administration, and shows qualities of leadership or promise through extra-scholastic activities.

John Henry Cowles Prizes.—Two prizes, established by John H. Cowles, Grand Commander of the Supreme Council of Thirty-third Degree (Mother Council of the World) of the Ancient and Accepted Scottish Rite of Freemasonry, Southern Jurisdiction of the United States of America. Awarded annually to the senior in the School of Government and Business Administration and to the senior in the School of Public and International Affairs with the highest academic averages.

DeWitt Clinton Croissant Prize.—Awarded annually to the undergraduate student enrolled in a course in drama or active in University dramatics who submits to the English Department the best essay on drama or the theater.

E.K. Cutter Prize.—Established by Marion Kendall Cutter "for excellence in the study of English." Awarded to the member of the graduating class whose record in English, combined with general excellence, shows most marked aptitude for and attainment in English studies.

Isaac Davis Prizes.—Awarded annually to the three seniors who made the greatest progress in public speaking while enrolled in the University. Awards are to be determined by a public-speaking contest in which the participants deliver original orations. Only members of the senior class of Columbian College of Arts and Sciences who are candidates for the degree of Bachelor of Arts or Bachelor of Science are eligible to compete.

Delta Gamma Prize.—Awarded annually by Beta Rho Chapter to the woman who, at the end of her freshman year, has the most outstanding record in scholarship, extracurricular activities, and service to the University.

Elton Prize.—Established by the Reverend Romeo Elton, of Exeter, England, and awarded annually to the student with the highest average in the most advanced course in the Greek language and literature.

Jesse Frederick Essary Prize in Journalism.—Established by Helen Essary Murphy and awarded annually to a student who has given promise of sound citizenship and who submits the best printed and published evidence of ability in "forthright reporting" and good journalistic writing, in a student publication or elsewhere.

Joshua Evans III Prize in Political and Social Sciences.—A memorial prize "established by friends because of an outstanding life." Awarded annually to that man in the graduating class "who has demonstrated his signal ability in the social and political sciences and who has given promise of the interpretation of that ability in good citizenship among his fellows."

Willie E. Fitch Prize.—Established by James E. Fitch in memory of his son. Awarded annually to a senior student for the best examination in chemistry.

Alice Douglas Goddard Prize.—A memorial established by Frederick Joseph Goddard, of Georgetown, D.C. Awarded annually to the upper-division student making the highest average in American literature.

Edward Carrington Goddard Prize.—Established by Mary Williamson Goddard, Alice Douglas Goddard, and Frederick Joseph Goddard, of Georgetown, D.C., in memory of Edward Carrington Goddard, class of 1881. Awarded to the junior or senior student making the highest average in the French language and literature.

Morgan Richardson Goddard Prize.—A memorial established by Mary Williamson Goddard, Alice Douglas Goddard, and Frederick Joseph Goddard, of Georgetown, D.C. Awarded to the junior or senior student making the highest average in the following fields: business administration, economics, international business, and public accounting.

Gardiner G. Hubbard Memorial Prize in United States History.—Established by Gertrude M. Hubbard in memory of her husband and awarded annually to that member of the graduating class majoring in history who has maintained the highest standing in courses in United States history.

Kappa Kappa Gamma Prize.—Awarded annually to a full-time lower-division student for excellence in Biological Sciences 12.

David Lloyd Kreeger Prizes in Art.—Five prizes given by Mr. Kreeger, three in the fine arts and two in art history and theory (including museology). Fine arts prizes are awarded to a senior or graduate student in painting, sculpture, and graphics (design). One prize in art history and theory is awarded to a

senior and one to a graduate student. Candidates for the prizes must submit original papers or works of art. Winners are selected by distinguished representatives of the field of art in the Washington, D.C. area.

Minna Mirin Kullback Memorial Prize.—Established in 1968 by Solomon Kullback in memory of his wife. Awarded annually by a committee of faculty members of the Department of Statistics to a full-time undergraduate or graduate student majoring in statistics, who will have completed 18 semester hours of statistics courses by the end of the spring semester.

Craig Sterling Logan Memorial Prize.—Established by Washington City Round Chapter of Sigma Alpha Epsilon. A plaque awarded annually to an outstanding freshman man of high academic achievement who has participated in extracurricular activities for the betterment of the University.

Mortar Board Prize.—A silver cup awarded annually to the woman student in the sophomore class having an average of *B* (or equivalent) or higher and the most outstanding record in activities.

Vivian Nellis Memorial Prize.—Awarded to a student in the English Department who has shown special promise in the field of creative writing.

Old Men Prize.—A plaque awarded annually by the Old Men Board to a man in the junior class who has made outstanding contributions to student activities.

Omicron Delta Kappa Prize.—A plaque awarded annually by Alpha Delta Circle to "that member of the senior class who throughout his course has done the most constructive work in the furtherance and upbuilding of the University student activities."

Order of Scarlet Prize.—Awarded annually by the Board of Governors of Order of Scarlet to that member of the sophomore class who has the most outstanding record in extracurricular activities and service to the University.

Panhellenic Association of Washington, D.C., Prize.—A trophy to be awarded to the Panhellenic Sorority maintaining the highest yearly scholastic average at the University for the previous year.

Phi Delta Kappa Prize.—Awarded annually by Beta Gamma Chapter to the outstanding senior man in the teacher education program in the School of Education.

Phi Eta Sigma Prize.—A choice book selected from the field of the recipient's major, awarded annually by the George Washington University Chapter to the male student attaining the highest scholastic average in his first full semester of work. The winner's name is engraved on a plaque in the Office of the Dean of Columbian College of Arts and Sciences.

Pi Beta Phi Prize.—Awarded annually by the District of Columbia Alpha Chapter to the woman member of the senior class who throughout her college course has done the most constructive work in the promotion of student activities among the women of the University.

Pi Lambda Theta Prize.—Awarded annually by Alpha Theta Chapter to the outstanding senior woman in the teacher education program in the School of Education.

Psi Chi Prizes.—Two prizes awarded annually by the George Washington University Chapter to the best undergraduate student in experimental psychology and to the graduate student submitting the best Master's thesis in psychology.

Ruggles Prize.—Established by Professor William Ruggles, awarded annually to a candidate for a Bachelor's degree, for excellence in mathematics.

Hermann and Johanna Richter Schoenfeld Prize.—Established in grateful appreciation of the inspired teaching and devotion to his students of Dr. Hermann Schoenfeld, who for more than 20 years until his death in 1926 headed the Department of German. Hermann Schoenfeld, Ph.D., LL.D., was widely recognized as a scholar of distinction whose service on the faculty added prestige to the University. This prize is given annually to a member of the graduating class for excellence in the historical and cultural phases of German studies.

Smith Kline & French Prize.—Awarded annually to the student who submits the best undergraduate research project in psychology.

Society of Colonial Wars in the District of Columbia Prize.—A gold medal awarded to a candidate for a graduate degree who, in the judgment of the Faculty of the Department of History, submits a thesis or dissertation demonstrating excellence in historical research in American Colonial history. The University reserves the right to withhold the award if no thesis or dissertation attaining the required degree of excellence is submitted.

Staughton Prize.—Established by the Reverend Romeo Elton and awarded annually to the student making the best record in the most advanced course in the Latin language and literature.

James MacBride Sterrett, Jr., Prize.—Established by Professor Sterrett in memory of his son. A copy of the *American Institute of Physics Handbook*, awarded annually to the student who obtains the highest average in Physics 1 and 2.

Charles Clinton Swisher Historical Club Prize.—Established by the Charles Clinton Swisher Historical Club and augmented in 1941 by the bequest of Professor Swisher. Awarded annually to the student who submits the best essay covering some phase of medieval history.

Thomas F. Walsh Prize.—Awarded annually to the student who submits the best essay in Irish history.

Alexander Wilbourne Weddell Prize.—Established by Virginia Chase Weddell in memory of her husband. Awarded annually to a candidate for a degree who writes the best essay on the subject of "the promotion of peace among the nations of the world." The prize essays shall become the property of the University and shall not be printed or published without the written consent of the University. The University reserves the right to withhold the award if no essay attaining the required degree of excellence is submitted.

Regulations

A STUDENT ENROLLED in the University is required to conform to the following University regulations and to comply with the rules and regulations of the college, school, or division in which he is registered.

A student who withdraws or is suspended, or is otherwise absent from the University for one semester or more, may re-enter and continue his work only under the rules and regulations in force at the time of his return.

If a student knowingly makes a false statement or conceals material information on an application for admission, registration card, or any other University document, his registration may be cancelled. If such falsification is discovered after the student has established an academic record at the University,

he may be subject to dismissal from the University. Such a student will be ineligible (except by special action of the Faculty) for subsequent registration in the University.

ATTENDANCE

A student may not attend classes until registration is completed and fees due are paid. Regular attendance is required. A student may be dropped from any course for undue absence.

SCHOLARSHIP REQUIREMENTS

A student who fails to maintain the scholarship requirements of the college, school, or division in which he is registered may be dismissed from the University.

GRADES

Grades are mailed to the student through the Office of the Registrar at the close of each semester. They are not given out by instructors.

UNDERGRADUATE

Columbian College of Arts and Sciences and School of Public and International Affairs.—The following grading system is used: *H*, honors; *HP*, high pass; *P*, pass; *F*, fail; *I*, incomplete; *W*, authorized withdrawal. The grade of *CR* (credit) or *NC* (no credit) is assigned only for Proseminar courses. A student may not repeat for credit a course in which he has received a grade of *Pass* or better, unless required to do so by the department concerned. A written statement to this effect must be submitted to the Registrar by the appropriate departmental chairman.

School of Education and School of Government and Business Administration.—The following grading system is used: *A*, excellent; *B*, good; *C*, average; *D*, pass; *F*, fail; *CR*, credit; *NC*, no credit; *I*, incomplete; *W*, authorized withdrawal. A student may not repeat for credit a course in which he has received a grade of *D* or above, unless required to do so by the department concerned. A written statement to this effect must be submitted to the Registrar by the appropriate departmental chairman.

GRADUATE

The following grading system is used: *A*, excellent; *B*, good; *C*, minimum pass; *F*, fail; *I*, incomplete; *CR*, credit; *W*, authorized withdrawal. A student may not repeat for credit a course in which he has received a grade of *C* or above, unless required to do so by the department concerned. A written statement to this effect must be submitted to the Registrar by the appropriate departmental chairman.

INCOMPLETE/AUTHORIZED WITHDRAWAL

Whenever a grade has not been assigned, the symbol *I* (incomplete) or the symbol *W* (authorized withdrawal) will be recorded. The symbol *I* indicates

that a satisfactory explanation has been given the instructor for the student's failure to complete the required work of the course. An "incomplete" cannot be made up after the lapse of one calendar year except by written permission of the dean's council of the college, school, or division concerned. An incomplete which is not removed within one calendar year is automatically changed to an *F*. An incomplete cannot be removed by repeating the course.

THE QUALITY-POINT INDEX*

Scholarship is computed in terms of the quality-point index, obtained by dividing the number of quality points by the number of semester hours for which the student has registered, both based on his record in this University. Quality points are computed from grades as follows: *A*, four points; *B*, three points; *C*, two points; *D*, one point; *F*, no points, for each semester hour for which the student has registered. Courses marked *W*, *I*, *NC*, or *CR* are not considered in determining the index, except that courses marked *I* will be considered when a formal grade is recorded. An incomplete which is not removed within one calendar year is automatically changed to an *F*. Grades in courses taken at another institution are not considered in computing the quality-point index.

CREDIT/NO CREDIT OPTION

A junior or senior student in the School of Education or the School of Government and Business Administration who has a cumulative quality-point index of 2.50 or better, may, with the approval of his adviser and dean, take one course a semester and receive a grade of *CR*, credit, or *NC*, no credit, which will be recorded on the student's transcript but will not be reflected in his quality-point index. No student will be allowed to take more than 4 credit/no credit courses. A student must sign up for such an option at registration. Under no circumstances may a student change from credit/no credit status to graded status, or vice versa, after the end of registration. Courses required in the student's major field may not be taken on the credit/no credit basis. A transfer student may not choose this option until the second semester of his enrollment at this University.

EXAMINATIONS

Examinations for undergraduate courses are scheduled at the end of each semester or at the completion of the course.

ACADEMIC DISHONESTY

Academic dishonesty on the part of any student will result in a disciplinary grade of *F* for the course involved and also may, upon the recommendation of the appropriate dean's council, result in his suspension from the University for a stated period, at the end of which time he may petition for readmission. The disciplinary grade of "Failure—Academic Dishonesty" will be recorded for the course involved, and this grade will be employed in the computation of the

* Applicable only to the Graduate School of Arts and Sciences, the School of Education, the School of Government and Business Administration, and the graduate programs in the School of Public and International Affairs.

quality-point index or academic standing. A student so suspended shall be withdrawn from all other courses except those in which all work has been completed.

WITHDRAWAL

Withdrawal from a course or from the University requires the permission of the dean of the college, school, or division in which the student is registered. Permission to withdraw from the University will not be granted a student who does not have a clear financial record (see pages 32-33).

Withdrawal between the last working day* in October and the end of the fall semester and between the last working day* in February and the end of the spring semester is permitted only in exceptional cases.

All charges for courses dropped without the approval of the dean must be met by the student. Reporting the dropping of a course to an instructor does not effect its discontinuance.

CHANGES IN PROGRAM OF STUDY

Changes within a College, School, or Division.—A student may not substitute one course for another, drop courses (see "Withdrawal," above), change his status from credit to audit or audit to credit without the approval of the dean of the college, school, or division in which he is registered.

Change from one section to another of the same course may be made with the approval of the dean and the department concerned.

Change from one major subject to another within the same college or school may be made with the approval of the dean. All requirements of the course of study to which the change is made must be met.

Transfer within the University.—Except in cases of normal progression from the lower division of Columbian College of Arts and Sciences in a regular baccalaureate program, application for transfer to another college, school, or division must be made to the appropriate admitting office on the form provided by that office and must be approved by the deans concerned. Application for transfer from the lower division of Columbian College to the upper division or to Bachelor's candidacy in the School of Education, the School of Government and Business Administration, or the School of Public and International Affairs must be made on the appropriate form. This form is available in the Office of the Dean of Columbian College.

A maximum of 45 semester hours earned in the Division of University Students can be applied toward a Bachelor's degree in a degree-granting college or school of the University. Work done in the Division of University Students will not be counted toward a graduate degree unless prior written approval, obtained from the relevant degree-granting college or school, has been filed in the Office of the Dean of the Division of University Students (see pages 169-70).

Students transferring within the University are advised to study carefully the graduation requirements on pages 48-49 and to note that in all undergraduate divisions, except the lower division of Columbian College of Arts and Sciences, 30 semester hours, including at least 12 semester hours in the major field, must be completed while registered in the school or college from which the degree

* The University work week is Monday through Friday, inclusive.

is sought. Upon transfer the student should consult the dean concerned and understand clearly the requirements he must fulfill. (For residence requirements in the lower division of Columbian College of Arts and Sciences, see pages 78 and 83.)

CREDIT

Credit is given only after registration for a course and satisfactory completion of the required work, or upon the assignment of advanced standing in accordance with the regulations of the several colleges, schools, and divisions.

Auditing.—In special instances, a person who has been admitted to the University may be registered, with the permission of the instructor, as an "auditor" in a class (no academic credit). An auditor is not required to take active part in the exercises or to take examinations. A student who takes a course as an auditor may not repeat it later for credit.

BALANCE SHEET

On request, the Registrar will issue to undergraduate degree candidates a balance sheet showing the amount of work completed and the requirements remaining to be met for the degree. A second balance sheet is issued only if the student changes major or degree objectives.

TRANSCRIPTS OF RECORD

Official transcripts of student records are issued on request of the student or former student who has a clear financial record. A fee of one dollar is charged for each transcript.

SUMMER SCHOOL CREDIT

A student who plans to attend summer school at another institution and apply credit so earned toward graduation from this University must first secure the written approval of his dean. In no event will credit in excess of what might be earned in a similar period in this University be recognized.

CONTINUOUS REGISTRATION

Degree candidates are expected to maintain continuous registration until *all* degree requirements are satisfied. Students who have completed course registration (including the thesis) must maintain continuous registration by paying the "continuous registration" fee (see page 30). By failing to register for one semester or more, the student breaks his registration and must be readmitted (see "Readmission," page 26). A "Readmitted Student" is required to satisfy the curriculum requirements existing at the time of his readmission.

Students must be registered during the summer if they are taking courses, are taking required examinations, are receiving guidance toward theses or dissertations, or are expecting to graduate at the end of the Summer Sessions.

MILITARY LEAVE

A student called to active duty may be granted military leave for the period of active duty, upon presentation to his dean of a copy of his orders and a peti-

tion for such leave. The maintenance of "continuous registration" is not required of the student on military leave; however, he must apply for readmission to the University well in advance of the semester in which he expects to return. Payments for tuition and fees which are not refunded to the student at the time he is granted military leave will be maintained as a deferred credit for his account and use upon his return to the University.

GRADUATION REQUIREMENTS

Degrees are conferred in February, June, and September.

To be recommended by the Faculty for graduation a student must have met the admission requirements of the college or school in which he is registered; completed satisfactorily the scholarship, curriculum, residence, and other requirements for the degree for which he is registered; and be free from all indebtedness to the University. Registration, either for course work or on the "continuous registration" fee basis, is required for the semester or summer session immediately preceding the awarding of a degree.

Application for Graduation.—An "Application for Graduation" form must be filed and the appropriate fee paid at the time of registration for the last semester or summer session of the senior or final year. Students completing degree requirements during the Summer Sessions will be awarded diplomas (no formal convocation) September 30, *provided* they have completed all degree requirements and have applied for graduation as a part of registration for the Summer Sessions.

Scholarship.—The student must meet the scholarship requirements for the particular degree for which he is registered.

Curriculum.—Minimum curriculum requirements for each degree are stated under the college or school offering work in preparation for the degree.

Residence.—Unless otherwise specified, in all undergraduate divisions of the University, a minimum of 30 semester hours, including at least 12 hours in the major field, must be completed while registered in the school or college from which the degree is sought. This requirement applies to students transferring within the University as well as to students transferring from other institutions. Summer work may be counted toward the residence requirement, but in no case may the period of residence aggregate less than thirty weeks. Unless special permission is granted by the dean of the college or school concerned to pursue work elsewhere, the work of the senior or final year must be completed in the college or school from which the degree is sought.

The graduate student must meet the residence requirements for the particular degree for which he is registered.

National Teacher Examinations.—All candidates for the degree of Bachelor of Arts in Education are required to take the National Teacher Examinations.

Attendance and Conduct.—The University reserves the right to refuse to confer a degree upon a candidate whose attendance or conduct has been unsatisfactory.

Thesis or Dissertation.—A thesis or dissertation submitted in partial satisfaction of requirements for a degree must be presented in its final form to the dean of the college or school concerned no later than the date specified in the University Calendar.

Accepted theses and dissertations, with accompanying drawings, become the property of the University and are deposited in the University Library, where

the duplicate copies are bound and made available for circulation. Permission to publish or adapt material in them must be secured from the appropriate dean. See the appropriate college or school in this catalogue for regulations governing theses and dissertations.

HONORS

WITH DISTINCTION

In all undergraduate divisions of the University the degree may be conferred "With Distinction," at the discretion of the Faculty, if a student meets the specific requirements of his college or school, as follows:

1. Columbian College of Arts and Sciences or School of Public and International Affairs—the attainment of Honors grades in 60 per cent of the courses taken at this institution; or
2. School of Education or School of Government and Business Administration—the attainment of a quality-point index of 3.50 or higher on all course work taken at this institution.

To be eligible, a student must have completed at this institution at least one-half of the courses required for the degree.

SPECIAL HONORS

Special Honors may be awarded by the Faculty to any member of the graduating class for outstanding achievement in the student's major field on recommendation of the major department. The student must fulfill all of the following requirements:

1. He must have his candidacy for Special Honors approved by the faculty member representing the major department or field not later than the beginning of the senior year.
2. He must meet such other conditions as may be set at the time his candidacy is approved.
3. He must have completed at this institution at least one-half of the courses required for the degree.
4. He must fulfill the specific requirement of the college or school in which he is registered, as follows: (a) Columbian College of Arts and Sciences or the School of Public and International Affairs—attainment of High Pass or Honors grades in 50 per cent of the courses taken at this institution; or (b) the School of Education or the School of Government and Business Administration—maintain a quality-point index of at least 3.00 on all course work taken at this institution.

THE LIBRARY

All students registered in the University have the privilege of using the University Library. Its stacks are open, and all students are welcome to browse at their leisure. The Student Identification Card, issued upon the payment of fees, must be presented when books are borrowed for outside use.

The loan period for most books available for outside circulation is 30 days. A fine of 25 cents is charged for each day a book is overdue. Any book which circulates is subject to recall by the Library if needed for reserve or other use. Reserve books must be used in the reserve reading room when the Library is

open, except that they may be withdrawn for overnight use beginning at 8:30 p.m. A fine of 50 cents is charged for each hour or fraction thereof that a reserve book is overdue. Grades of a student are withheld until his library record is clear.

All students using the University Library are expected to be familiar with its detailed regulations, available on application to any of the Library's service desks.

RIGHT TO DISMISS STUDENTS

The right is reserved by the University to dismiss or exclude any student from the University, or from any class or classes, whenever, in the interest of the student or the University, the University Administration deems it advisable.

RIGHT TO CHANGE RULES

The University and its various colleges, schools, and divisions reserve the right to modify or change requirements, rules, and fees. Such regulations shall go into force whenever the proper authorities may determine.

UNIVERSITY POLICY ON THE RELEASE OF STUDENT INFORMATION

In general, the policy of the University is one of attempting to keep the student's record confidential and out of the hands of those who would use it for other than legitimate reasons. At the same time, the policy must be flexible enough not to hinder the student, the University, or the community in their legitimate endeavors.

No information concerning a student will be released, except as noted below, unless required by court order or subpoena, or requested in writing by the student:

1. Information which is of public record, such as whether or not the student is currently enrolled; dates of attendance; whether or not he received a degree; current address and telephone number; the school or college in which he is enrolled.
2. The issuance of formal transcripts of record to recognized institutions of higher learning; the certification of academic achievement to the various recognized professional associations (law, medicine, engineering, education, etc.) and the inspection of records, under appropriate supervision, by properly validated representatives of government investigative agencies.

UNIVERSITY POLICY ON SELECTIVE SERVICE INFORMATION

The University notifies draft boards of a student's academic status only when the student requests or authorizes, in writing, that the draft board be notified. A Selective Service Information Card is put into the registration packet of each male student who has not reached his 26th birthday, registered on campus exclusive of those in the National Law Center and the School of Medicine. This card contains the following statement:

By my signature below, I hereby authorize the University, to notify my draft board of my academic status in the University, or of any changes in academic status that occur during this semester.

If the student signs the card, the University then automatically notifies the draft board. If the student does not sign the card, no notification is sent. National Law Center students and students in the School of Medicine should check with the appropriate dean's office for details of the policy in their school.

PROPERTY RESPONSIBILITY

The University is not responsible for the loss of personal property. A "Lost and Found" Office is maintained in the Campus Security Office.

RECENTLY ESTABLISHED REGULATIONS

An Appendix (pages 463-64) contains regulations recently approved by the University's Board of Trustees.

Cooperative Programs

CONSORTIUM OF UNIVERSITIES OF THE WASHINGTON METROPOLITAN AREA, INC.

FIVE UNIVERSITIES in Washington, D.C.—American University, Catholic University of America, *George Washington University*, Georgetown University, and Howard University—have formed a Consortium through which they are coordinating the use of their respective facilities. As the arrangement develops, juniors, seniors, and graduate students in approved programs leading to degrees in any one of the universities will increasingly have the opportunity to select from the combined offerings of all five universities the particular courses which best meet their needs.

Participation is limited to campus degree candidates. The following, however, are excluded: freshman and sophomore students, and students in Canon Law, Dentistry, Medicine, and Theology. Law students are also excluded from participation, except for candidates for the degree of Master of Laws at George Washington University and Georgetown University.

Special courses, such as private instruction (as in music or art) or tutorial study and courses in preparation for passing the language requirement, are excluded from the Consortium program. Also excluded are courses offered in Reserve Officer Training Corps programs.

Students are encouraged to study the announcements of programs of all five universities. See page 28 for information concerning registration for Consortium courses. *A student may not take courses at another university that are available at his own.*

Registration forms and instructions are available from the registrar of the student's university. The student registers and pays at his own university for all Consortium courses.

AIR FORCE RESERVE OFFICERS' TRAINING CORPS (AFROTC)

The Department of Aerospace Studies at Catholic University of America, under provisions of an agreement between George Washington University and Catholic University, offers a two-year AFROTC program.

The successful completion of the program qualifies the student for a reserve commission in the United States Air Force upon graduation. Exceptionally well-qualified students may receive a Regular Officer appointment. The program is designed to provide education that will develop skills and attitudes vital to the career professional Air Force Officer. Emphasis is placed on qualities of leadership and other attributes essential to progressive advancement into positions of increasing responsibility as commissioned officers in the Air Force.

Full-time students who have two years remaining toward a baccalaureate or graduate degree are eligible to enter the program. Each student must meet physical and mental standards set by the Air Force. Candidates must complete six weeks of Field Training, conducted by the Air Force at designated bases, during the summer preceding enrollment into the program. A student must have and maintain a quality-point index of 2.00 or its equivalent. Applications must be made *early* in the academic year prior to the one of enrollment in the program, so that all qualification criteria may be met in time for selection consideration in the spring.

The program is offered at Catholic University. At the time of enrollment, registration fee must be paid. There is no tuition charge. Students in the program receive a monthly retainer fee of \$50. Uniforms and textbooks are furnished without cost. Students participating in the Field Training phase are paid at a rate established by the U.S. Government and are also furnished travel expenses and from the Field Training base.

Interested students should consult the Department of Aerospace Studies, Catholic University of America, Washington, D.C. 20017.

GRADUATE STUDY AND RESEARCH PROGRAMS

The University and the Smithsonian Institution cooperate in a program in American Civilization leading to the degree of Doctor of Philosophy. Graduate academic work taken at George Washington University and special seminars and dissertation research in the museums of the Smithsonian Institution provide unusual opportunity to the student specializing in American Civilization.

A parallel cooperative program in American Civilization has been established by the University and the Library of Congress. Special seminars and reading courses and dissertation research in library-related subjects, together with the graduate academic work at the University, give the student an educational and training experience that only this combination can provide.

The University and the National Bureau of Standards have entered into a cooperative agreement to further educational opportunity at both the University and the Bureau. This arrangement holds great promise for graduate study and research, particularly in the physical sciences and engineering.

The Speech and Hearing Clinic

Director of Speech Pathology and Audiology, J.W. Hillis

THE SPEECH AND HEARING CLINIC offers diagnostic and remedial work for children and adults with such communication difficulties as stuttering, lisping, cleft palate speech, cerebral-palsied speech, and voice, articulatory, and hearing

problems. Diagnostic and remedial work is also available for persons with non-standard language usage due to such conditions as hearing loss, brain damage, mental retardation, and environmental factors.

Fees.—The fee for an initial evaluation is \$20. Fees for additional specialized testing are dependent on the testing involved. The fees for individual speech or hearing therapy range from \$3 to \$10 a session. Fees are reduced for full-time students enrolled in the University and for persons receiving group therapy. Fees are payable at the Office of the Cashier.

The Reading Center

Director, Mary Ellen Coleman

THE READING CENTER offers individual diagnostic and corrective services for all levels: primary, elementary, secondary, and adult. In addition, special reading improvement classes are conducted for high school and college students as well as other adults.

A complete diagnosis includes psychological tests; vision, hearing, dominance, and spelling tests; and various types of reading achievement and aptitude tests. Results are interpreted, and a written report is presented in conference with the parents or the individual.

The special reading improvement classes for high school students, college students, and other adults are offered throughout the year at stated intervals. Emphasis is placed on improvement of vocabulary, speed, comprehension, and study skills. Instruction in spelling is also provided as needed. Mechanical aids such as the tachistoscope, rate accelerator, and controlled reader are available for increasing speed of comprehension.

Fees.—The fee for individual diagnosis is \$60; for individual instruction, \$8 a lesson; for semi-individual instruction, \$6 a lesson; for instruction in small groups with common reading difficulties, \$5 a lesson. Fees are reduced for full-time students currently enrolled in George Washington University. All fees are payable in advance at the Office of the Cashier.

Veterans Education

THE OFFICE OF THE REGISTRAR, Luther Rice Hall, 2121 Eye Street, N.W., assists students entitled to educational benefits as veterans or war orphans with any problems which may arise concerning their benefits. This Office also processes certification of enrollment and attendance to the Veterans Administration so that monthly allowances will be paid.

When feasible, students entitled to benefits as veterans or war orphans should consult the Office of the Registrar prior to submitting application to the Veterans Administration. All such students should obtain the instruction sheet issued by the Office of the Registrar, which sets forth requirements to be fulfilled before certification of enrollment can be made to the Veterans Administration, and which includes other information of general interest.

The Veterans Administration is at 2033 M Street, N.W., Washington, D.C. 20421.

University Computer Center

Director R.E. Thomas

THE UNIVERSITY COMPUTER CENTER is located on the first floor of Stuart Hall 2013 G Street, N.W. The facilities of the Center are available for academic purposes to all registered students and to members of the instructional staff. The Center has as its principal mission the provision of a powerful computing system which serves the University in its educational and research endeavors. The Center's programming staff concentrates its efforts in conducting faculty and staff seminars, consulting with users in the preparation of complicated programs, and carrying out computer-oriented research.

The Computer Center equipment consists of an IBM system 360 Model 50 computer with 256,000 positions of core storage, a 2314-disk storage unit providing on-line storage for more than 200 million characters, a card read/punch, a high speed line printer, and four tape drives. The principal languages that are available are FORTRAN IV, COBOL, Programming Language One (PL/1), Assembly Language, Report Program Generator (RPG), ALGOL, and SNOBOL3. In addition, there are numerous utility, statistical, data manipulation, and simulation systems available in the Computer Center Library of Programs. Facilities are available on a first-come, first-served basis for preparation of programs and data.

Computer programming courses are offered by the School of Government and Business Administration, the Department of Statistics, and the School of Engineering and Applied Science. In addition, many other departments offer courses that utilize the computer as a research adjunct to course work.

The Computer Center is open 24 hours a day from 8 a.m. Monday to 4 p.m. Saturday.

General Alumni Association

THE OBJECTIVES OF THIS ASSOCIATION are to unite the graduates who wish to associate themselves for charitable, educational, literary, and scientific purposes, and to promote the general welfare of the University.

Eligible members are those who have matriculated in any school of the University and who have left the University in good standing, or any person who is or has been a member of the teaching, research, or administrative staff of the University, or of the Board of Trustees of the University. Active members are those eligible members who are current contributors (dues or otherwise) to or life members of the George Washington University General Alumni Association, the Alumni Association of any school of the University, or contributors to the George Washington University Fund.

The Alumni Office is in Bacon Hall, 2000 H Street, N.W., Washington, D.C. 20006.

All alumni are urged to keep the Alumni Office informed of changes of address or occupation and to supply information with regard to their fellow alumni.

STUDENT LIFE

Vice President for Student Affairs W.P. Smith, Jr.

Director of the University Center B.C. Bell

Associate Dean of Students Marianne Phelps

Associate Dean of Students P.R. Sherburne

THE OFFICE OF THE VICE PRESIDENT FOR STUDENT AFFAIRS develops Student Life programs, policies, and procedures to complement the University's formal instruction program. These activities are implemented through the offices of the Associate Deans of Students, Health Services, International Students, Psychological Clinic, Student and Alumni Career Services, Student Activities, residence halls, and University Center.

STUDENT SERVICES

RESIDENCE HALLS

Associate Dean of Students Marianne Phelps

Assistant Dean of Students Elizabeth Garraway

Assistant Dean of Students David Speck

Housing Administrator Ann Webster

Complete information concerning the University's residence halls is available from the Housing Administrator, George Washington University, Washington, D.C. 20006. Information concerning off-campus housing near the University may be obtained at this Office. The reservation of rooms in private houses must be made by students.

Admission to the University does not include a room reservation. The student will receive, with this notification of acceptance, University residence hall information, an application for residence hall space, a medical examination form, and a declaration of intent to attend the University. The medical examination form must be completed by the applicant and his physician and returned to the University Health Services Office. The application for residence hall space must be accompanied by a \$100 *nonrefundable deposit* (\$200 for applicants admitted by early decision). Early decision students *must* submit the deposit by January 15. The housing deposit is credited toward the semester's room charge. Rooms are leased for the academic year, and payment must be made in advance of each semester.

1970-71 Residence Hall Rates per Person for Two Semesters*

	<i>Room and Food Service</i>	<i>Room Only</i>
For Men:		
Adams Hall		
double room.....	\$1,260	\$650
triple room.....	1,210	600
Calhoun Hall		
double room.....	1,210	600
triple room.....	1,160	550
Crawford Hall—double room.....	1,210	600
Madison Hall (graduate and professional students)		
double room.....	1,260	650
Mitchell Hall—single room.....	1,310	700
For Women:		
Graduate Women's Residence—apartment for three.....	1,310	700
Strong Hall (upperclass women)		
single room.....	1,310	700
double room.....	1,260	650
Thurston Hall		
double room, triple room, large suite for four.....	1,260	—
smaller suite for four, suite for six.....	1,210	—

FOOD SERVICE

Residents of Thurston Hall and all resident freshmen are required to participate in the food service plan. The plan is optional for all other residents. Well-balanced meals are served cafeteria style five days a week (15 meals). Food service payment does not cover University holidays or vacation periods. All meal cards admit to the dining rooms in Thurston Hall and Mitchell Hall. Residents of Calhoun, Crawford, Madison, and Strong halls are given preference for the use of the dining room in the University Center.

UNIVERSITY CENTER

Director B.C. Bell

Assistant Director D.L. Cotter

Program Director A.G.R. Bellefontaine

Financial Officer L.R. Moore

The term University Center encompasses a building, an organization, and a program. The building is the University's center for community life. It is the physical instrument for implementation of the programs and objectives of the organization.

The organization, composed of students, faculty, administrators, and alumni in the form of a three-board structure, provides an informal education medium for individual and group activities adapted to the leisure-time interests and needs of the University community. It also provides training for those directly involved in management and programming for the Center.

The primary purpose of the George Washington University Center is the continuing development of a broad cultural, intellectual, social, and recreational

* Rates subject to change.

tional program. Its secondary purpose is the provision of its various services and facilities to the campus community for the development of community life.

The Center houses a wide range of facilities to serve the needs of the campus, including dining rooms and a rathskeller, a bookstore, lounges and study areas, a theater, bowling lanes and a billiard room, a University Club, student organization offices and workrooms, meeting and conference rooms, an information center, music listening rooms, social areas, shower and dressing rooms, lockers, and parking accommodations.

HEALTH SERVICES

Director R.B. Castell, M.D.

The Health Services Staff assists students with their medical needs by advice and treatment, by proper referral when necessary, and by cooperation with other physicians. For medical emergencies and health consultations there is, on the campus, a Student Health Clinic open Monday through Friday, from 9 a.m. to 10 p.m. during the academic year and from 9 a.m. to 9 p.m. during the Summer Sessions, with physician in attendance. On Saturdays, a physician is available from 9 a.m. until 12 noon. For night and weekend emergencies, students may go to the emergency room of the University Hospital for treatment. The basic fee for this visit will be paid by the Health Services, and all other charges will be the responsibility of the student. This arrangement is for emergency care only.

Medical privileges also include hospitalization, including board and nursing, in the University Hospital for not more than one week during any twelve-month period—the necessity to be determined by the Director of Health Services*. These privileges do not include coverage for maternity or other conditions arising from a pregnancy. All additional hospital charges for operating room, anesthetics, laboratory, X-ray, medications, or any special services must be paid by the student. Expenses incurred for examinations and treatment by specialists, such as eye refraction and provision of glasses, orthopedic examinations and application of cast or other appliance, laboratory and X-ray work, and surgical operations, must be paid by the student.

These medical benefits apply only to illness or disability incurred while currently enrolled in the University. They do not apply to illness or disability incurred between the last day of examinations for a semester or summer session and completion of registration for the next semester or summer session.

The student may, if he so desires, engage physicians and nurses of his own choice, but when he does so he will be responsible for the fees charged.

Rules: (1) the Director of Health Services is empowered to limit or deny the medical benefits when, in his discretion, a student has, by his misconduct or breach of the rules of the University, made himself ineligible; (2) the Director of Health Services has authority to determine the necessity and length of hospitalization; (3) a student not currently enrolled or one who has severed his connection with the University is ineligible for medical benefits; (4) a student intending to train for an athletic team is required to pass a thorough examination; (5) the hospitalization privilege provided by the University is not available to those students covered by any other type of hospitalization.

See rule (5) for exception.

The University is not responsible for injuries received in intercollegiate or intramural games, or in any of the activities of the Department of Physical Education.

HEALTH AND ACCIDENT INSURANCE

In addition to the above services, the Health Services Office has arranged for Health and Accident Insurance, on an elective basis, for *full-time* students. Arrangements for insurance coverage are the responsibility of the student. The University assists in the subscription process by administering application cards and collecting fees during official registration periods.

A student must subscribe and pay for the coverage at the time of official registration of his school or college. For those few students who register late, the subscription will be available during official late registration. *Subscription during late registration will not be available for those students who previously registered and failed to subscribe at that time.* Students who participate in the Summer Advanced Registration Program must subscribe and pay for the coverage on the appropriate date of the Summer Advanced Registration. Students who participate in the pre-registration, conducted in April for the following Fall Semester, must subscribe for the coverage at the time of pre-registration in April. The fee will be included with the tuition bill and must be paid by August 1.

The fee charged and the coverage provided are effective, whether at the University, at home, or elsewhere, on a 6-month basis—September through February for those subscribing for the fall, and March through August for those subscribing for the spring. The fee charged at each official registration period will be the payment required for full coverage for a 6-month period and must be paid in full at the time of subscription.

The policy contract is between the individual and the insurance carrier and is accepted at any hospital or emergency room that accepts this type of medical coverage. Details of the policy are contained in a folder available at the Health Services Office.

PSYCHOLOGICAL CLINIC

Director E.L. Phillips

The George Washington University Psychological Clinic offers services which are available primarily to students enrolled in the University.

The services are designed to assist individuals in the evaluation of their educational, personal, and social lives; diagnose academic difficulties and provide remedial measures such as study-habits instruction and programmed instruction; and refer individuals to qualified agencies for assistance with problems not handled by the Clinic. Behavior therapy, individual and group psychotherapy, and individual and group counseling are available.

The Clinic also provides special assessments including diagnostic measurements prescribed by the School of Engineering and Applied Science, admissions tests for the University and for other selected educational institutions, and some selected assessments for business and industry.

Fees.—For students who are currently registered as degree candidates in the University, the fee is \$20; for students currently enrolled in the University

not as degree candidates, \$60; for graduates of the University, \$60; for community clients, \$85. Fees for specialized testing are dependent upon the services involved. All fees are payable at the Office of the Clinic.

INTERNATIONAL STUDENTS

Adviser W.A.R. Walker

International House is the campus center for students from foreign countries. It serves also as the headquarters of the International Students' Society, which seeks to promote international friendship and understanding by welcoming to its membership students from all countries, including those from the United States.

The Adviser to International Students has his Office in International House and is available for consultation each day throughout the school week.

STUDENT AND ALUMNI CAREER SERVICES OFFICE

Career Services Officer Gertrude McSurely

The Student and Alumni Career Services Office, Woodhull House, 2033 G Street, N.W., provides assistance to degree-seeking students and alumni seeking full-time, part-time, temporary, or permanent employment.

The Office maintains a registry of positions available in many fields, both locally and nationally, and refers qualified applicants for consideration. The Office administers the On-campus Industrial and Government Recruitment Interview Program for seniors and graduate students, in which private companies, government agencies, service organizations, public school systems, and universities participate. The Office also handles the referral and placement functions of the on-campus College Work-Study Program. Prospective teachers may establish permanent credentials files in the Student and Alumni Career Services Office. This service includes files for alumni seeking college and university faculty and administrative positions. The Office also provides individual interviews for students and alumni wishing career guidance.

RELIGIOUS LIFE

The University recognizes the contribution that religion makes to the life of its students and encourages them to participate in the various religious organizations of their own choice. Catholic, Jewish, and Protestant bodies sponsor various groups and form a link between the University and the religious community. The advisers of the religious organizations are available for counseling.

Religious services in various traditions are provided regularly for the University community as announced.

INTER-FAITH FORUM

At a weekly luncheon, a discussion is led by faculty and students who are asked to speak and participate in open discussion on topics concerning religious, social, and moral issues. The discussions are held Wednesdays from 12 noon to 1 p.m. Schedules are obtainable at the Religious Activities Office.



STUDENT ACTIVITIES

Activities Coordinators J.H. Boyar, Lianna Larabee

The offices of the Vice President for Student Affairs, the Associate Deans of Students, and the Director of the University Center are responsible for all co-curricular phases of student life, such as student activities, social life, and housing.

STUDENT ACTIVITIES OFFICE

The Student Activities Office, located on the fourth floor of the University Center, is a service of the division of Student Affairs. It serves to provide for the facilitation of student activities; to maximize the opportunities for direct involvement of students in co-curricular educational experience, and to locate and utilize community and University resources which may contribute to a program for the mutual benefit of both students and the community. The staff assists student organizations in leadership training, programming, and community service projects. The Office also serves as a central information location for publicizing the University master activities calendar; for registering and cataloguing of campus organizations, events, and facilities; and for aiding in communication between campus organizations. Students interested in participating in any phase of University life, including social, cultural, community, or academic programming, should acquaint themselves with the staff, facilities, and functions of the Office.

STUDENT GOVERNMENT

The University believes in encouraging the development of responsibility and leadership in students by providing various avenues of expression within its governmental structure. Whether in residence hall governments, faculty-student policy committees, school councils, or all-student assemblies, the opportunity for student participation in University decision-making and policy implementation is both substantial and varied. Student government, with the advice and counsel of offices of the Division of Student Affairs, reinforces the educative process through practical living experience.

Committee on Student Life.—The function of the Committee on Student Life is to review acts of student groups engaged in extracurricular activities. It may make recommendations to the President of the University at his request or on its own initiative.

Despite its broad powers, the Committee acts only when it believes that a vital interest of the University has been overlooked. The Committee, appointed by the President, is composed of 14 members, equally divided between students and faculty.

Hearing Committee on Student Affairs.—The University Hearing Committee on Student Affairs hears and decides all cases arising under the rules and regulations of the University governing student conduct. It also hears and decides cases arising under the rules and regulations of student governmental bodies and student organizations. Its decisions take the form of advice to the President of the University as to what action may be deemed appropriate in such cases.

The Hearing Committee has appellate jurisdiction in all cases first heard before student organizations empowered to conduct regulatory hearings, with authority to reverse the findings and judicial actions taken by those bodies.

The Hearing Committee has original jurisdiction in those cases in which one or more of the aforementioned bodies is a party to the case, or whenever one of the aforementioned bodies yields its own original jurisdiction. The Committee's original jurisdiction also extends to cases arising under the Human Relations Act and under the regulations adopted by the University for the preservation of academic freedom.

Membership is comprised of 6 students and 6 members of the faculty, appointed by the President. Meetings are held monthly. Due process is guaranteed in all cases.

UNIVERSITY CENTER GOVERNMENT

The University Center Governing Board is designed to advise upon and evaluate the overall administration of the Center, subject to the authority of the Board of Trustees, as delegated to the President of the University. Membership consists of 7 students, 4 faculty, 2 administrators, and one alumni representative.

The University Center Operations Board, concerned with the policies relating to the daily operation of the Center, works coordinately with the professional staff and within the framework of broad policies established by the Center Governing Board. The Board consists of 11 student members. Its primary objective is to make the Center facilities as accessible, useful, and enjoyable as possible for all members of the University community.

Through its committee structure, the Program Board of the University Center provides for a variety of cultural, intellectual, social, and recreational programs on campus. The Program Board consists of 13 students.

ELIGIBILITY FOR STUDENT ACTIVITIES

Any student registered in the University is eligible to participate in nonathletic student activities of the University; however, a student whose scholastic record has placed him on probationary status is not eligible to be any of the following:

1. A member of the Band, Cheerleaders, Committee on Student Life, Epsilon Chi Omega, Epsilon Sigma Phi, George Washington University Dance Company, Greek Club, Hearing Committee on Student Affairs, Interfraternity Council, Phi Kappa Phi, Hellenic Council, Religious Council, Residence Hall Councils, or any public relations staff.

2. Any officer, permanent committee chairman, or member of the executive board of any activity.

The rules and policies of the National Collegiate Athletic Association govern participation in intercollegiate athletics.

The control and administration of all student activities are outlined in *The Student Handbook*.

SPORTS

The University is a member of the National Collegiate Athletic Association. Its teams participate in intercollegiate contests in basketball, baseball, tennis, golf, rifle, soccer, wrestling, and crew.

The University offers a broad program of extramural sports activities for both men and women through the Department of Physical Education.

PERFORMING ARTS

Students may participate in dance, drama, forensics, music, and radio broadcasting through the following organizations: Enosinian Debating Society; George Washington University Dance Company; Station WRGW; University Chamber Choir, Chorus, Orchestra; and University Players. Each of these groups presents programs during the academic year.

With the cooperation of the Curator of Art, an annual student art exhibit is presented.

MAJOR PROGRAM EVENTS

Recreation Program.—The University Center Program Board and the Department of Physical Education arrange dances, movies, and trips at frequent intervals for all students.

Concert Program.—The University Center Program Board sponsors concerts each semester at which nationally known entertainers perform.

Orchestra Series.—The University Orchestra offers a series of concerts throughout the academic year.

University Concert Series.—Offered by the Department of Music throughout the academic year.

Art Exhibits.—The work of locally, nationally, and internationally known artists is shown in monthly exhibits in the Dimock Gallery in Lisner Lounge and the art gallery of the University Center.

Winter Weekend.—Scheduled in the latter part of the fall semester, Winter Weekend includes Homecoming activities, theater productions, a carnival, and athletic events.

Religion in Life Program.—Special emphasis is given to the place of religion in contemporary society in this program of events during the fall and spring semesters.

Holiday Season.—The University traditionally greets the holiday season with appropriate ceremonies including the lighting of the Christmas tree, the singing of Christmas music, and service projects.

Spring Weekend.—This is the traditional time for the award of honors in student activities. Mortar Board and Omicron Delta Kappa announce and present their new members. Activities also include concerts and a cruise on the Potomac.

STUDENT ORGANIZATIONS

HONOR SOCIETIES

Phi Beta Kappa.—A national honor society recognizing "outstanding intellectual capacity well employed" in the field of liberal arts and sciences. Senior

and junior students who are candidates for the degree of Bachelor of Arts or Bachelor of Science in Columbian College and who have shown broad cultural interests, distinguished scholarly achievement, high character, general promise, and scholarly ideals may, to a number not exceeding 15 per cent of a class, be elected to membership by the Faculty members of the Alpha Chapter of the District of Columbia. Seniors and juniors in other schools of the University who meet the above requirements are also eligible for consideration for membership, provided that their program of studies includes appreciable work in the liberal arts.

Sigma Xi.—A national scientific honor society, the purpose of which is to encourage original investigation in science, pure and applied. Outstanding undergraduate students in the sciences are eligible for full membership, and undergraduate graduates who have shown marked ability in research may be elected to associate membership.

Alpha Kappa Delta.—A national sociology society.

Alpha Lambda Delta.—A national fraternity established to encourage and reward high scholarship and attainment, membership in which is limited to those freshman women who attain a scholastic average of at least 3.50, or equivalent.

Delphi.—An intersorority honorary society.

Delta Phi Epsilon.—A foreign service fraternity.

Delta Sigma Rho-Tau Kappa Alpha.—A national forensic society.

Dobro Slovo.—National Slavic languages honor society.

Echoes.—Junior women's honor society.

Gate and Key.—An intrafraternity honorary society.

Iota Sigma Pi.—A national chemical society for women.

Mortar Board.—A national society for senior college women, stressing leadership, scholarship, and service.

National Collegiate Players (Pi Epsilon Delta).—A national drama honor society.

Omicron Delta Epsilon.—A national economics society.

Omicron Delta Kappa.—A national fraternity emphasizing leadership in extracurricular activities.

Order of Scarlet.—A service honorary society for sophomore and junior men.

Phi Eta Sigma.—A national fraternity, established to encourage and reward high scholarship and attainment, membership in which is limited to those freshman men who attain a scholarship average of at least 3.50, or equivalent.

Phi Sigma Tau.—A national philosophy honor society.

Pi Mu Epsilon.—A national mathematics honor society.

Psi Chi.—A national psychology fraternity.

Sigma Alpha Eta.—A national speech and hearing fraternity.

Sigma Delta Pi.—A national Spanish honor society.

Tassels.—A service honorary society for sophomore women.

PROFESSIONAL ORGANIZATIONS

Alpha Chi Sigma (chemistry), Alpha Kappa Psi (commerce and economics), Delta Nu Alpha (national professional transportation fraternity), International Association of Students in Business and Economics, Phi Delta Gamma (graduate), Phi Delta Kappa (education), Pi Lambda Theta (education)

Sigma Delta Chi (journalism), Society for the Advancement of Management, Student Health Care Organization.

SOCIAL FRATERNITIES

Delta Tau Delta, Kappa Sigma, Phi Sigma Delta, Phi Sigma Kappa, Sigma Alpha Epsilon, Sigma Alpha Mu, Sigma Chi, Sigma Nu, Sigma Phi Epsilon, Tau Epsilon Phi, Tau Kappa Epsilon.

SOCIAL SORORITIES

Alpha Epsilon Phi, Delta Gamma, Delta Phi Epsilon, Kappa Alpha Theta, Kappa Kappa Gamma, Phi Sigma Sigma, Pi Beta Phi, Sigma Delta Tau.

DEPARTMENTAL CLUBS

American Civilization Undergraduate Majors, Anthropology Club, Education Council, Enosinian Debating Society, Geology Club, German Club, Russian Club, Society of Physics Students, Women's Recreation Association.

RELIGIOUS ORGANIZATIONS

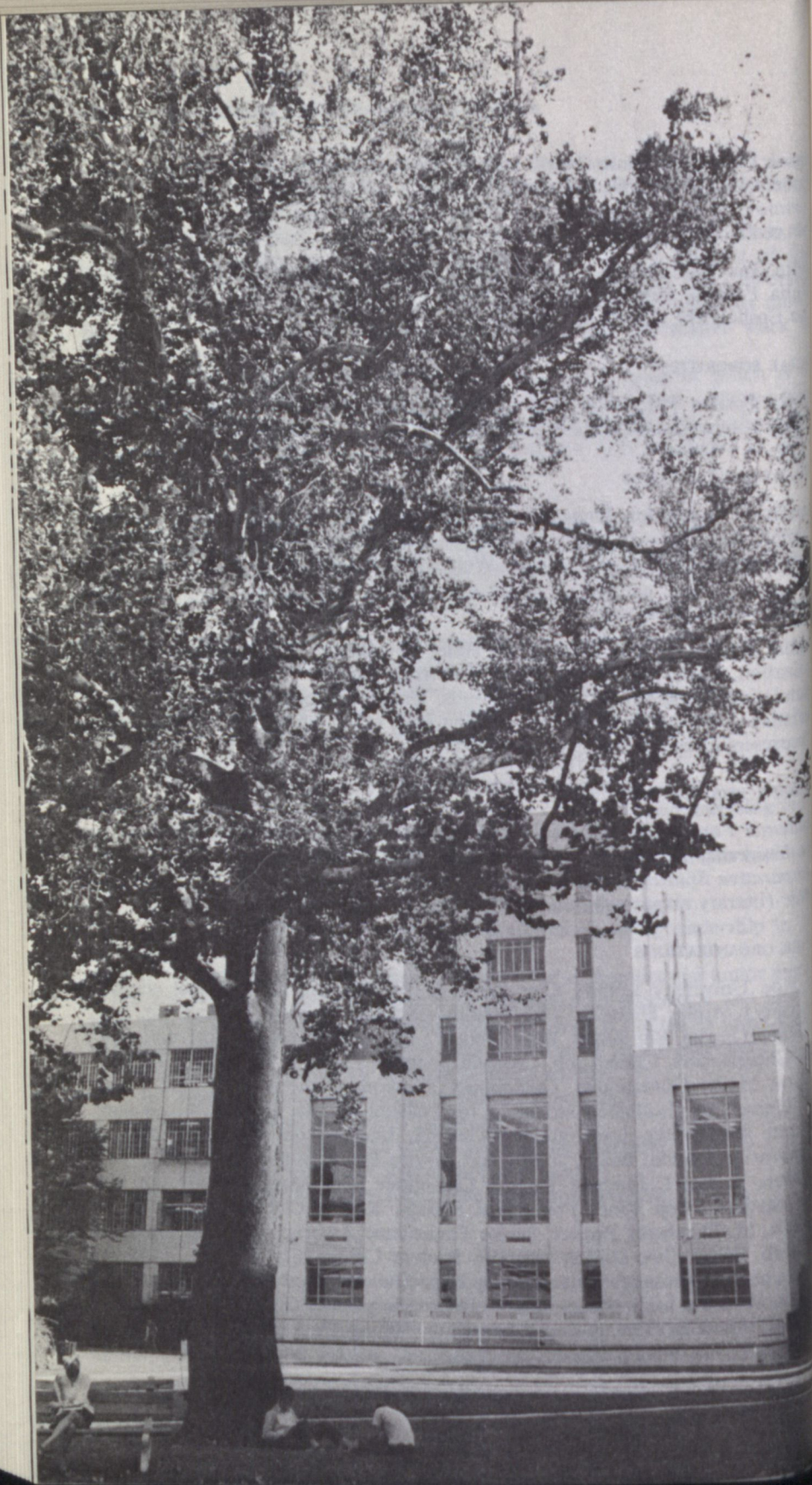
Baptist Student Union, B'nai B'rith Hillel Foundation, Christian Science Organization, Eastern Orthodox Club, Lutheran Student Association, Newman Foundation, Religious Society of Friends, Unitarian-Universalist Club, United Christian Fellowship, Wesley Foundation, and a Religious Council comprised of representatives of all religious organizations.

STUDENT PUBLICATIONS

Academic Forum (student-faculty journal), *The Cherry Tree* (the yearbook), *The University Hatchet* (semi-weekly newspaper), *Journal of International and Comparative Studies* (publication of Consortium graduate students), *The Pommac* (literary magazine), *Student Directory*.

OTHER ORGANIZATIONS

Ad Hoc University Library Committee, Alpha Phi Omega (national service fraternity), Alpha Theta Nu (scholarship winners), Amateur Radio Club, Art Students' League, Big Sisters, Black People's Union, Caravansary International, Inc., Cheerleaders, Chess Club, Colonial Boosters, Colonial Ski Club, Commission on Model Government, Community Relations Committee, Cricket Club, Free University, Graduate Association for Political Studies, Hostel Club, Indian Cultural Association, Interfraternity Council, International Students' Society, Intersorority Athletic Board, Joint Food Service Board, Junior Panhellenic Association, Lower Columbian Honors Committee, Old Men, Organization of Arab Students, Pep Band, Premedical Society, Rappel Club, Residence Hall Councils, St. Elizabeths Project, Senior Panhellenic Association, Share, Skydiving Club, Speak Out, Station WRGW, Student Community Alliance, Student Rotto of the National Speleological Society, Student International Meditation Society, Students for a Democratic Society, Vietnamese Club, Young Americans for Freedom, Young Democrats Club, Young Hegelian Society, Young Republican Club, Young Socialist Alliance.



COLUMBIAN COLLEGE OF ARTS AND SCIENCES

Dean C.D. Linton

*Assistant Deans Barbara Dunham, J.L. Métivier, Jr.,
R.C. Rutledge, H.E. Yeide, Jr.*

FACULTY

Professors J.G. Allee, Jr., Joseph Aschheim, Otto Bergmann, J.L. Breen, J.W. Brewer, H.F. Bright, R.G. Brown, A.E. Burns, Elizabeth Burtner, W.E. Caldwell, G.V. Carroll, I.H. Cisin, J.H. Coberly, C.W. Cole, Milton Crane, R.H. Davison, Louis De Alessi, V.J. DeAngelis, A.H. Desmond, Julian Eisenstein, C.E. Galbreath, Wood Gray, Andrew Gyorgy, R.G. Hanken, I.B. Hansen, R.C. Haskett, G.F. Henigan, P.H. Highfill, Jr., H.C. Hinton, H.H. Hobbs, Herbert Jehle, R.G. Jones, J.W. Kendrick, Hewitt Kenyon, J.C. King, D.C. Kline, J.L. Knetsch, G.M. Koehl, W.H. Kraus, Solomon Kullback, J.F. Latimer, Thelma Z. Lavine, H.L. LeBlanc, W.K. Legner, L.P. Leite, Sar Levitan (*Research*), B.I. Levy, J.B. Levy, E.J.B. Lewis, H.W. Lilliefors, C.D. Linton, T.P.G. Liverman, W.A. MacDonald, G.L. Mangum (*Research*), G.E. Mazzeo, H.M. Merriman, F.H. Michael, Charles Milton (*Research*), R.H. Moore, Edith Mortensen, J.N. Mosél, S.C. Munson, Gardner Murphy (*Visiting*), C.R. Naeser, David Nelson, Benjamin Nimer, H.J. Parry (*Research*), T.P. Perros, E.L. Phillips, R.E. Purcell, J.P. Reesing, Jr., J.W. Robb, Mario Rodríguez, H.M. Sachar, B.M. Sapin, R.H. Schlagel, W.E. Schmidt, R.P. Sharkey, F.R. Siegel, Henry Solomon, Loretta Stallings, R.W. Stephens, E.L. Stevens, C.T. Stewart, Jr., H.M. Stout, Rafael Supervia, C.T. Taam, Geza Teleki, R.B. Thompson, R.C. Vincent, R.D. Walk, R.H. Walker, Jr., D.S. Watson, R.L. Weintraub, E.R. Weismiller, D.G. White, R.K. White, R.E. Wood, Helen Yakobson, A.J. Zuchelli

Adjunct Professors J.G. Banks, J.C. Broderick, T.F. Carroll, W.H. Crocker, Barend de Vries, John Gibson, E.G. Kauffman, J.W. Pierce, I.G. Sohn, Norman Ture

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Adjunct Associate Professors C.J. Lange, Donald Robinson

Assistant Professors D.T. Allensworth, A.D. Andrews II, Alice Andrews, D.L. Atkins, Martha Bair, Ruth Bari, J.T. Bennett, B.P. Berube, Dorothy Betz, J.A. Bull III, J.W. Claiborne, Gayle Clapp, G.F. Conner, Gerald Donaldson, Barbara Dunham, B.C. Field, J.P. Fox, J.E. Fredland, H.I. Gates, Kosara Gavrilovic (*Research*), H.F. Gillette, Jr., V.K. Golla, Fuller Griffith, R.A. Hadley, Lilien Hamilton, Suzanne Hammersberg, C.S. Harris, J.M. Harrison, Julia Hicks A.J. Hildebeitel, R.W. Holmstrom (*Visiting*), R.L. Humphrey, Jr., G.P. Huvé, Christopher Jehn, Nancy Johnson, M.A. Kandel, N.K. Khatcheressian, Ruth Krulfeld, D.L. Lee, Myrna Lee, Patricia Lenger, J.M. Logsdon, J.C. Lowe, Diane Majerus, C.R. Mann, Mabel McEwan, B.M. Mergen, Mary Miller, Margaret Montzka, Subramaniam Moryadas, Charles Mudge, W.G. Nash, Honey Nashman, Elizabeth Neyman, G.A. Olkhovsky, W.C. Parke, Judith Plotz, J.A. Quitslund, Sonya Quitslund, Joan Regnell, J.R. Roman, Jr., Fredrica Rosenberg, D.A. Rowley, Sally Sibley (*Research*), Suzanne Simons, Mykola Stepanenko, Phyllis Stewart, E.A. Stone, Margaret Sullivan, R.E. Thomas, Irene Thompson, N.A. Tilkens, J.L. Tropea, G.C.Y. Wang, S.J. Wayne, Lawrence Winkler, W.T. Woodward, Judith Young, J.E. Ziolkowski

Adjunct Assistant Professors H.J. Cassidy, J.K. Kern, Mary Norton, Henry Peskin

Instructors Margaret Bonney, K.E. Bumgarner, Nancy Bunge, Janet Collins, Catherine Cook, R.L. Dabney, Alice Digilio, Hazel Eagle, R.S. French, N.C. Garner, Evelyn Lynch, James McPherson, Anne-Marie Schmutz, C.W. Sten, K.L. Storrs, Mary Walden, Diane Weber

COMMITTEES*

LOWER DIVISION DEAN'S COUNCIL†

1970: A.D. Andrews II, W.L. Turner
1971: Dorothy Betz, Muriel McClanahan
1972: J.M. Harrison, Bernard Reich

* The Dean of Columbian College of Arts and Sciences is an ex officio member of all committees.
† Elected by the Faculty.

UPPER DIVISION DEAN'S COUNCIL*

1970: A.D. Kirsch, H.M. Sachar
1971: Joseph Aschheim, H.H. Hobbs
1972: F.L. Minn, C.A. Moser

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G.M. Koehl (*Chairman*), A.D. Kirsch, E.J.B. Lewis, T.P. Perros, J.L. Métivier, Charles Rice, Lawrence Winkler

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H.E. Yeide, Jr. (*Chairman*), Barbara Dunham, J.A. Frey, R.G. Hanken, G.E. Mazzeo, R.C. Rutledge, S.O. Schiff, R.C. Vincent

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COMMITTEE ON HONORS PROGRAM

H.E. Yeide, Jr. (*Chairman*), Linda DePauw, R.N. Ganz, Jr., W.B. Griffith, G.E. Mazzeo, J.A. Morgan, Jr., R.B. Thompson, three student representatives

COMMITTEE ON THE USE OF CORRECT ENGLISH

R.M. Moore (*Chairman*), J.G. Allee, Jr., G.F. Henigan, Muriel McClanahan, R.C. Willson

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CHAIRMAN

Mark Sullivan, Jr. (*University Trustee*), Auchincloss, Parker & Redpath, Washington, D.C.

MEMBERS OF THE COUNCIL

Windsor P. Booth, *Chief of the News Service, National Geographic Society*
Waldron Faulkner, *Faulkner, Stenhouse, Fryer & Faulkner, Washington, D.C.*

* Elected by the Faculty.

† This Council serves both Columbian College of Arts and Sciences and the Graduate School of Arts and Sciences. The President of the University, the Vice President for Academic Affairs, the Dean of Columbian College of Arts and Sciences, and the Dean of the Graduate School of Arts and Sciences are ex officio members of the Council.

David Edward Finley (*Retired Director of the National Gallery of Art*), Washington, D.C.

Robert R. Garvey, Jr., *Executive Secretary, Advisory Council on Historic Preservation*, Washington, D.C.

Patrick Hayes, *Washington, D.C.*

Jean Ross Howard, *Assistant Director, Vertical Life Aircraft Council*, Washington, D.C.

Wolfgang Herbert Kraus, *Professor of Political Science and International Affairs* Jeremiah Milbank, Jr. (*University Trustee*), New York, N.Y.

William T. Pecora, *Director, Geological Survey, U.S. Department of the Interior*

John Palmer Reesing, Jr., *Professor of English*

Sidney Dillon Ripley II (*University Trustee*), *Secretary, Smithsonian Institution*

Julian H. Singman, *Attorney, Washington, D.C.*

Sidney William Souers, *Rear Admiral, USNR (Ret.) (University Honorary Trustee), Chairman of the Board, General American Life Insurance Company, St. Louis, Mo.*

Ira Rockwood Telford, *Professor of Anatomy*

Louis B. Wright, formerly *Director, Folger Shakespeare Library*

INTRODUCTION

Since its founding in 1821, Columbian College of Arts and Sciences, the liberal arts college of the University, has continued to expand and develop with the city of Washington. Its central situation makes participation in the life of the Nation's Capital convenient for resident students. The cosmopolitan nature of the student body reflects the atmosphere of a great world capital. Because the students come from the fifty states and from ninety foreign countries, class discussions and casual student conversations are enriched by a challenging variety of viewpoints.

Columbian College offers programs leading to the degrees of Bachelor of Arts, Bachelor of Science, and Bachelor of Science in Medical Technology; prelegal and premedical programs; the first two years of the professional programs in Education, in Government and Business Administration, and in Public and International Affairs; and a terminal curriculum in Accounting which may be completed within two to three years.

All entering freshmen and transfer students of less than junior class standing, except those in the fields of engineering and applied science, enter the lower division of Columbian College. The division is primarily concerned with providing (1) the personal and academic guidance needed in adjusting to college life and in selecting and preparing for a major field and (2) the broad cultural foundations in language and literature, science, and social studies on which major-field specialization in the upper division is built.

During the junior and senior years the student is in the upper division, where he is guided by his major adviser. A student who plans to continue toward a Master's degree should plan his Bachelor's program so that it will prepare him for the graduate work of his interest.

Columbian College has degree-granting authority over the off-campus programs leading to the degrees of Bachelor of General Studies (areas of concentration

in history, mathematics, political science, and psychology), Bachelor of Science in Environmental Health, Bachelor of Science in Geodetic and Cartographic Science, and Bachelor of Science in Oceanography.

These off-campus degree programs are administered by the College of General Studies.

THE COLUMBIAN COLLEGE PROGRAM

The Columbian College program is a contemporary application of the historic liberal arts tradition. Its purpose is to enable the student to develop both his particular abilities and his general awareness as a human being. It demands of the student a thorough acquaintance with one major area of learning and at the same time an understanding of how that specialization fits into the larger context of the scientific, social, and moral problems which confront modern man. It stresses not merely expertness but that broadly enlightened expertness which encourages its graduates to grow through the years in ability and wisdom.

SOPHOMORE YEAR IN PARIS PROGRAM

Freshmen who have received grades of Pass or higher in all course work during the first semester may be eligible to participate in the George Washington University-American College in Paris Sophomore Year in Paris Program. Qualified students will be encouraged to accept this opportunity to profit from the cultural and intellectual riches of Europe by spending their second year living and studying in Paris. Credits earned in this Program will be transferable toward a degree in Columbian College of Arts and Sciences. Since all courses are taught in English, a knowledge of French is not mandatory, but is desirable. Students with no training in the French language will be required to participate in an intensive five-week language program in Paris prior to the beginning of the academic year. (For "Language Study in Paris," see the 1970 *Summer Sessions Catalogue*.)

ENTRANCE REQUIREMENTS

Good character and an academic background appropriate for the program of studies contemplated are required.

LOWER DIVISION

Requirements for admission to the freshman class are as follows:

1. An acceptable certificate of graduation from an accredited secondary school, showing at least fifteen units* which must include four years of English; at least two years of one foreign language; two years of science, preferably with laboratory instruction; two years of social studies, one of which must be American history; and two years of college preparatory mathematics. One unit of algebra, or the equivalent, is prerequisite to courses in chemistry and statistics; and one unit in algebra and one unit in plane geometry, or the equivalent, are prerequisite to courses in mathematics and physics.

* A unit represents a year's study in a secondary school subject, including in the aggregate not less than 120 sixty-minute periods, or the equivalent, of prepared classroom work.

2. The principal's statement that the applicant is prepared to undertake college work.

3. College Entrance Examination Board scores must be submitted on the Scholastic Aptitude Test and the English Composition Achievement Test.

It is recommended that the examinations be taken in December or January. Scores on tests taken in the junior year may be submitted. Arrangements for tests are the responsibility of the applicant and should be made with the Educational Testing Service, 20 Nassau Street, Princeton, N.J. 08540; or 1947 Center Street, Berkeley, Calif. 94704, not less than one month before the date of the test. In applying for the test, the applicant should specify that the scores be sent to the Office of Admissions, George Washington University, Washington, D.C. 20006.

The Committee on Admission and Advanced Standing will consider the adequacy of the qualifications of an applicant who, because of unusual circumstances, does not present all of the formal requirements stated above. The Committee may prescribe appropriate scholastic-aptitude tests of the University.

UPPER DIVISION

The following are requirements for admission to degree candidacy in the upper division:

Bachelor of Arts.—Sixty-four hours of satisfactory academic work based on the *Arts and Letters* curriculum in the lower division, or the equivalent, are required.

Bachelor of Science.—Sixty-four hours of satisfactory academic work based on the *Science* curriculum in the lower division, or the equivalent, are required.

Bachelor of Science in Medical Technology.—Sixty-four hours of satisfactory academic work, including B Sc 11-12; Chem 11-12, 22, and 50, are required.

REGULATIONS

Regulations regarding ADMISSION, REGISTRATION, FEES AND FINANCES are stated on pages 23-33; other University regulations, on pages 43-51.

ACADEMIC WORK LOAD

A full-time student not on probation may take ordinarily not more than 17 semester hours. A student employed more than 20 hours a week who is not on probation may take not more than 10 hours.

The amount of work taken by a student on probation is limited by the Committee on Scholarship.

A full-time student who, during the immediately preceding semester, has received no grades below High Pass and has earned Honors grades in three courses totaling at least 9 semester hours may take 18 or 19 hours. An employed student who, during the immediately preceding semester, has received no grades below High Pass and has earned Honors grades in two courses totaling at least 6 semester hours may take not more than 12 hours.

A student who accepts employment after registration or at any time during a semester must report that fact immediately to the Dean so that his program may be adjusted, if necessary.

ATTENDANCE

The student is held responsible for all the work of the course in which he is registered, and all absences must be excused by the instructor in charge before provision is made for the student to make up work missed.

USE OF CORRECT ENGLISH

The use of correct English, oral and written, is required in all courses. Any student whose English in any course whatever is deemed unsatisfactory may be reported by the instructor to the Dean and to the Committee on the Use of Correct English. The Chairman of the Committee may assign supplementary work, without academic credit, varying in amount with the needs of the student. If the work prescribed is equivalent to a course, the regular tuition fee is charged. The granting of a degree may be delayed by failure to make up any such deficiency in English to the satisfaction of the Committee and the Dean.

HONORS

Lower Division Honors Program.—Columbian College offers an honors program for selected freshmen and sophomores. The program is designed to provide an appropriate challenge and opportunity for gifted students; to permit early identification of students with the highest potential for high-quality graduate work and success in competitive award programs; to introduce educational innovations which may possibly be applied at a later date to the student body at large; to bring together a group of students whose activities will enable them to contribute more significantly to academic discussion within the University as a whole; and to involve superior students in a program unmistakably identified with the liberal arts ideal of the generally educated man, thus balancing the emphasis on concentrated study that is the heart of existing departmental honors programs.

The program consists of 3 honors seminars, one freshman and two sophomore (see page 297), each limited to approximately 15 students. Each seminar carries 3 semester hours of credit, and represents elective hours in the student's program. Directors of the seminars invite expert faculty members from different fields to assist in discussion of particular problems. Students may elect a program of independent study in place of the second sophomore seminar.

Students are selected for the Honors Program from the entering freshman class each fall, and register for the first of the seminars in the spring semester. These students may remain in the Program as long as they earn grades of Honors or High Pass in 80 per cent of the courses they take. As places become vacant in the Program as a result of voluntary or involuntary withdrawal, students who have achieved an outstanding record during their freshman year may be selected to fill vacancies.

Successful participation in two semesters of honors work will qualify a student to have the designation "honors in the lower division" entered into his permanent record.

Lower Division Honor Roll.—The name of each lower division student who earns Honors grades in 60 per cent of all his course work at this University is placed on the Honor Roll, provided he has no Fail grades on his record. To be

eligible, the student must have completed no less than 15 semester hours. (A place on the Honor Roll does not necessarily mean that the student will receive honors upon graduation.)

Dean's List.—The name of every student who is taking a minimum of 15 semester hours in any one semester, who receives grades of Honors in at least 60 per cent of the course work taken in that semester, and has no grades of Fail for that semester, is placed on the Dean's List for that semester.

ACADEMIC STANDING

A student who is not suspended or on probation is considered to be in good standing.

The following rules governing probation and suspension are applicable as stated to students enrolled for a full-time program (12 semester hours or more) during the fall or spring semester. Students enrolled for less than 12 semester hours during the fall or spring semester and students enrolled during the summer sessions are subject to probation or suspension on the basis of their record for 12 semester hours, or multiples thereof, rather than on their record in any one semester.

PROBATION

A student who in one semester receives two grades of Fail in courses carrying 3 or more semester hours of credit each, or the equivalent, is placed on probation. A student on probation who receives one grade of Fail in such a course will be continued on probation for a second semester. A student on probation taking 12 or more semester hours whose grades are all Pass or better is removed from probation.

SUSPENSION

A student who in one semester receives grades of Fail in three courses carrying 3 or more semester hours of credit each, or the equivalent, is suspended. A student on probation who receives two or more grades of Fail in such courses is suspended. A student who receives one or more grades of Fail in such courses in a second semester of probation is suspended.

The minimum period of academic suspension is one fall or one spring semester. Final dates for applying for readmission are the same as those governing "Undergraduate Admission" (see pages 23-24). A suspended student seeking readmission must submit evidence to the Committee on Admission and Advanced Standing that during his absence from the University he has so conducted himself as to indicate that he will profit by readmission. A student suspended twice for poor scholarship will not be readmitted.

MID-SEMESTER WARNING

At the end of the seventh week of each semester, instructors file in the Office of the Dean the names of freshman and sophomore students who are doing unsatisfactory work. A notice of Warning is sent to the student and a copy filed with the appropriate adviser. A "Warning" constitutes notice to the student that he must consult his instructor and adviser at the earliest opportunity.

CORRESPONDENCE AND HOME-STUDY COURSES

No credit is given for work done by correspondence or in home-study courses.

CLASSIFICATION OF STUDENTS

A *freshman* is a student who is in the process of completing 32 semester hours, including 18 hours of his curriculum requirements.

A *sophomore* is a student who has completed between 32 and 64 semester hours, including 18 hours of his curriculum requirements.

A *junior* is a student who has completed between 64 and 94 semester hours and filed the declaration of his major, approved by his adviser, in the Office of the Dean.

A *senior* is a student who has completed between 94 and 124 semester hours, including at least 6 hours of second-group course work in his major.

An *unclassified student* is one who is not a candidate for a Bachelor's degree (normally because he already holds it), but who wishes for valid academic reasons to take a limited program for a limited time. Registration in this status is permitted only with the prior approval of the upper division Dean's Council.

The Lower Division

A STUDENT IN THE LOWER DIVISION is given the opportunity of taking a wide range of liberal arts subjects—humanities, foreign languages, sciences, social studies—both as a means of laying the groundwork for the more concentrated major-field study in the upper division and as a means of determining what academic area is best adapted to his interests and aptitudes. In order to insure that these general educational requirements are met, the student is not permitted to anticipate major-field special courses until all basic areas are covered.

ENTRANCE REQUIREMENTS

Entrance requirements of the lower division are stated on pages 71–72.

ADVISORY SYSTEM

Each student in the lower division is provided with two kinds of counseling. *Academic* advising is performed by members of the Faculty selected for their knowledge of freshman-sophomore requirements and programs, and each student makes up his program in consultation with the adviser assigned to him before registration. *Personal* counseling is available through the offices of the Associate Deans of Students. All students are encouraged to maintain close contact with their Faculty advisers.

Students who intend to transfer after the sophomore year to the School of Education, the School of Government and Business Administration, or the School of Public and International Affairs are assigned special advisers to assist them in planning their programs.

An academic warning system permits early attention to students whose work falls below required standards. In such cases, students are required to consult

regularly with their advisers. On request, copies of academic warnings or probation notices may be sent to parents or guardians, who are themselves welcome to meet with members of the advisory staff.

REQUIRED PLACEMENT EXAMINATIONS

English.—Students whose College Board English Composition Achievement Test scores suggest inadequate preparation may be assigned to Engl 1x or may be tested in vocabulary, spelling, grammar, standard usage, and writing skill, before placement in either Engl 1x or 1. Students whose scores indicate marked superiority will be allowed to waive the Engl 1 requirement.

Foreign Languages.—A standardized placement examination is required of all entering students who wish to continue in college the language begun in high school (Chinese, French, German, Italian, Russian, or Spanish). Upon completion of the examination, assignment is made to the appropriate course.

Mathematics.—New students registering for Math 30 are required, prior to registration, to take a placement examination in algebra and trigonometry.

FIRST- AND SECOND-GROUP COURSES

A freshman or sophomore may take second-group courses (courses numbered 101–200) only with the written permission of the instructor and of the Dean.* A student is not permitted to postpone a required first-group course to take a second-group course for elective credit. The principle that first-group courses must be taken in the freshman and sophomore years, and advanced courses in the junior and senior years, is rigidly adhered to in approving student programs. Freshmen and sophomores on probation may take second-group courses only with the written permission of the Committee on Scholarship.

PROFESSIONAL COURSES

Except for majors in Applied Mathematics and for students intending to apply for the combined degrees of Bachelor of Arts and Doctor of Medicine or the degree of Bachelor of Science in Medical Technology, not more than 12 hours of professional courses, i.e., courses offered in units of the University other than Columbian College, may be included in the 124 hours required for the Bachelor's degrees in Columbian College. Students electing professional courses under this rule must obtain the approval of the Dean before registration.

PHYSICAL EDUCATION REQUIREMENT

Freshmen and sophomores (except those enrolled in the Physical Education curriculum) are required to take four semesters of physical education (PE 4, 5, or 6) unless they are registered for less than 9 semester hours or unless regular employment during the day makes it necessary to take all classes during the evening hours.

Any other exemptions will be granted only upon written petition which has been recommended by the University Physician and approved by the Dean.

* Students enrolled in the terminal curriculum in Accounting may take those second-group courses which are specified as part of their curriculum without obtaining the written permission of the instructor or the Dean.

Students exempt from the physical education requirement must substitute four hours of elective.

The required medical and physical examinations, as specified by the Department of Physical Education, will be arranged at the beginning of each semester for those students who lack reports.

FOREIGN LANGUAGE REQUIREMENT

In curricula requiring foreign languages a student must complete satisfactorily the equivalent of two years of college work in a single foreign language. (Chinese*, French, German, Greek†, Italian, Latin†, Russian, Spanish).

A student offering for admission four acceptable high school units of a single foreign language, or the equivalent, is not required to take any foreign language.

A student who offers less than four units and wishes to meet the requirement by continuing in the same language must take the language placement test.

In general, one year of high school language is considered equivalent to one semester of college language.

In some instances foreign languages are required or recommended as preparation for advanced work. The student should consult his adviser so that appropriate foreign languages may be included, when necessary, in his lower division program.

ENGLISH REQUIREMENT

Entering students registered in the arts and sciences curricula must follow the sequence of Engl 1 or 1x, both halves of one of the introductory literature courses, and Engl 40. This does not apply to students transferring to these curricula or students registering in the preprofessional or terminal curricula.

EXAMINATIONS FOR WAIVING CURRICULUM REQUIREMENTS‡

A required course may be waived and admission to an advanced course granted by the passing of a waiver examination. Passing this examination does not entitle the student to any hours of credit. Written request to take the examination should be made to the Dean and the required fee paid at the Office of the Cashier before taking the examination.

TRANSFER FROM LOWER DIVISION TO UPPER DIVISION

On satisfactory completion of a lower division curriculum of 64 or more semester hours, the student must apply in the Office of the Dean for transfer to the upper division.

LOWER DIVISION CURRICULA

Each of the following curricula comprises the first two years of a standard four-year college course.

* Chin 5-6 is required of Chinese Studies majors.

† Greek and Latin not acceptable for International Affairs and Public Affairs majors.

‡ This provision does not apply to the premedical student, all of whose required premedical work must be taken in a recognized college of arts and sciences.

All curricula in this group may be applied toward the degree of Associate in Arts. Students wishing to receive this degree must apply at the Registrar's Office at the time of registration for the fourth or last semester. The last 15 semester hours must be spent in residence in Columbian College.

IN PREPARATION FOR THE UPPER DIVISION OF COLUMBIAN COLLEGE:

Arts and Letters

First two years of the Bachelor of Arts curriculum:

	Semester Hours
Comp & Lit: Engl 1 or 1x; Clas 71, 72, Engl 51-52, 71-72, or 91-92, Fren 51-52, Germ 51-52, Ital 51-52, Slav 91-92, or Span 51-52; and Engl 40.....	12
*Language:	12
†PE:	4
Science: B Sc 3-4 (nonscience majors) or 11-12 (science majors); Chem 3-4 (nonscience majors) or 11-12 (science majors); Geol 1-2; or Phys 1, 2, or 9-10 (nonscience majors)	6-8
Social Studies: AmCv 71-72; Anth 1-2; Econ 1-2; Geog 51, 52; Hist 39-40 or 71-72; P Sc 5-6; or Soc 1-2.....	6
‡Elective:	22-24
Total.....	64

Science

First two years of the Bachelor of Science curriculum:

	Semester Hours
Comp & Lit: Engl 1 or 1x; Clas 71, 72, Engl 51-52, 71-72, or 91-92, Fren 51-52, Germ 51-52, Ital 51-52, Slav 91-92, or Span 51-52; and Engl 40.....	12
Language: French, German, Russian, or nonscience elective.....	12
NOTE.—A reading knowledge of French, German, or Russian is required. This may be satisfied by Fren 4 or 6, Germ 4, or Slav 4 or 6, or by special examination.	
Math: Math 3, 6, or electives.....	6
NOTE.—The Math 3 requirement may be satisfied by offering two years of high school algebra acceptable for admission; the Math 6 requirement may be satisfied by offering one-half year of high school trigonometry acceptable for admission.	
†PE:	4
Science: B Sc 11-12	8
Two additional full-year courses are required, to be chosen from Chem 11-12, Geol 1-2, and Phys 1, 2.....	14-16

* See page 77 for foreign language requirement.

† See pages 76-77 for physical education requirement.

‡ It is suggested that electives include one of the following courses: Art 31-32, 71-72; Mus 3, 4; Phil 61-62; Rel 9, 10, 21, 59-60.

The student should obtain the advice of his major department as to proper prerequisite and collateral courses for the intended major.

Credit may be given for a limited number of courses elected in Physical Education, with the approval of the Dean.

	Semester Hours
Social Studies: AmCv 71-72; Anth 1-2; Econ 1-2; Geog 51, 52; Hist 39-40 or 71-72; P Sc 5-6; or Soc 1-2.....	6
*Elective:	0-2
Total.....	64

Premedical

Premedical students may follow either the Arts and Letters or the Science curriculum above in fulfilling the first 64 semester hours of the premedical requirement. Each premedical program must be approved by the premedical adviser. For admission to most medical schools, a minimum of 90† semester hours applicable toward a degree in an approved college of arts and sciences must include the following:

1. **Biology:** 8 semester hours. This may be either in general biology or zoology but may *not* include separately credited courses in botany.
2. **Chemistry:** 8 semester hours of general inorganic chemistry (which may include qualitative analysis), including 4 semester hours of laboratory; and 6 to 8 semester hours of organic chemistry, including laboratory.
3. **Physics:** 8 semester hours, including at least 2 semester hours of laboratory.
4. **English:** 6 semester hours in composition and literature. This may be the usual introductory college course or its equivalent.

While not required for admission, courses in embryology, histology, genetics, and mathematics are strongly recommended.

With the exception of these specific requirements applicants are urged to follow their personal interests in developing their premedical courses of study. A well-balanced program, rather than a specific field, is the criterion by which an applicant is judged. It is not advisable to take courses that appear to cover subject matter in the medical program.

While well-qualified candidates are eligible for admission after completing the minimum 90 semester-hour requirement, the majority of applicants are found to be better prepared for the study of medicine after four years of college work.

Medical Technology

First two years of the Bachelor of Science in Medical Technology curriculum. See pages 87-88 for a description of the program and the requirements for the junior and senior years:

	Semester Hours
Comp & Lit: Engl 1 or 1x; Clas 71, 72, Engl 51-52, 71-72, or 91-92, Fren 51-52, Germ 51-52, Ital 51-52, Slav 91-92, or Span 51-52; and Engl 40.....	12
Language: French, German, Russian, or nonscience elective.....	12
NOTE.—A reading knowledge of French, German, or Russian is required. This may be satisfied by Fren 4 or 6, Germ 4, or Slav 4 or 6, or by special examination.	

*It is suggested that electives include one of the following courses: Art 31-32, 71-72; Mus 3, 4; Phil 61-62; Rel 9, 10, 21, 59-60.

†The student should obtain the advice of his major department as to proper prerequisite and collateral courses for the intended major.

Credit may be given for a limited number of courses elected in Physical Education, with the approval of the Dean.

‡The 4 semester hours of physical education required at George Washington University are not applicable toward admission to Medical School.

	Semester Hours
Math: Math 3, 6, or electives.....	6
NOTE.—The Math 3 requirement may be satisfied by offering two years of high school algebra acceptable for admission; the Math 6 requirement may be satisfied by offering one-half year of high school trigonometry acceptable for admission.	
*PE:	4
Science: B Sc 11-12.....	8
Chem 11-12, 22, 50.....	16
Social Studies: AmCv 71-72; Anth 1-2; Econ 1-2; Geog 51, 52; Hist 39-40 or 71-72; P Sc 5-6; or Soc 1-2.....	6
†Elective: May be selected in lieu of the various exemptions.	
Total.....	64

IN PREPARATION FOR THE SCHOOL OF EDUCATION

Education

First two years of the Bachelor of Arts in Education curriculum of the School of Education:

	Semester Hours
Engl: Composition—Engl 1 or 1x, 2.....	6
Literature—Engl 51-52, 71-72, or 91-92.....	6
Language: Chinese, French, German, Italian, Latin, Russian, or Spanish. See page 77 for foreign language requirement....	12
Math: Two semesters to supplement senior high school courses, chosen from Math 3, 6, 9, 10.....	6
*PE:	4
Psyc: Psyc 1, 22.....	6
Science: Three semesters (2 in biological science and one in physical science or vice versa) to supplement senior high school courses in those fields, chosen from B Sc 3-4 or 11-12; Chem 3-4 or 11-12; Geol 1-2; or Phys 1, 2, or 9-10. A Secondary Education Major offering for admission 2 or more acceptable senior high school units in the above areas of science may be exempted from one semester of this requirement	9-12
Social Studies: Hist 71-72 or P Sc 5-6.....	6
AmCv 71-72; Anth 1-2; Econ 1-2; Geog 51, 52; Hist 39-40 or 71-72; P Sc 5-6; or Soc 1-2.....	6
Sp&D: Sp&D 1 (or 11, if the Department so advises).....	3
Elective: May be selected in lieu of the various exemptions.	
Total.....	64-67

* See pages 76-77 for physical education requirement.

† It is suggested that electives include one of the following courses: Art 31-32, 71-72; Mus 3, 4; Phil 61-62; Rel 9, 10, 21, 59-60.

Credit is not given for courses in Physical Education.

Physical Education

First two years of the Bachelor of Science in Physical Education curriculum of the School of Education:

	Semester Hours
Engl: Composition—Engl 1 or 1x, 2.....	6
Engl: Literature—Engl 51-52, 71-72, or 91-92; or	
Soc: Soc 1-2	6
PE: PE 39-40, 49-50, 51-52.....	14
PE: PE 43-44	6
Psyc: Psyc 1, 22.....	6
Science: B Sc 3-4; Chem 3-4.....	12
Social Studies: AmCv 71-72; Anth 1-2; Hist 39-40 or 71-72; or P Sc	
5-6	6
Elective:	8
Total.....	64

**IN PREPARATION FOR THE SCHOOL OF GOVERNMENT
AND BUSINESS ADMINISTRATION****Accounting, Business Administration, and International Business**

First two years of the Bachelor of Business Administration curricula in Accounting, Business Administration, and International Business:

	Semester Hours
Acct: Acct 1-2	6
B Ad: B Ad 51.....	3
Comp: Engl 1 or 1x, 2.....	6
*Lang or Lit: Chin 3-4; Engl 51-52, 71-72, or 91-92; Fren 3-4 or 6, or	
51-52; Germ 3-4 or 51-52; Ital 3-4 or 51-52; Slav 3-4	
or 5 and 6, or 91-92; or Span 3-4 or 6, or 51-52.....	6
Math: Math 30, 31.....	6
†PE:	4
Science: B Sc 3-4 or 11-12; Chem 3-4 or 11-12; Geol 1-2; or	
Phys 1, 2, or 9-10.....	6-8
Social Studies: Econ 1-2, P Sc 5-6, and Psyc 1.....	15
Anth 1, Psyc 8, or Soc 1.....	3
Stat: Stat 51.....	3
†Elective: (Speech is recommended; students interested in Interna-	
tional Business include Geog 52).....	4-6
Total.....	64

Business and Economic Statistics

First two years of the Bachelor of Business Administration curriculum in Business and Economic Statistics:

	Semester Hours
Acct: Acct 1-2	6
Econ: Econ 1-2	6

* This requirement is waived for students who offer 4 years of acceptable high school work in a single foreign language.

† See pages 76-77 for physical education requirement.

‡ Credit is not given for courses elected in Physical Education.

	Semester Hours
Engl: Engl 1 or 1x, 2.....	6
*Language:	12
Math: Math 30, 31, 32.....	9
†PE:	4
P Sc: P Sc 5-6, or	
Phil: Phil 61-62.....	6
Stat: Stat 51 or 91, and 52.....	6
‡Elective:	9
Total.....	64

IN PREPARATION FOR THE SCHOOL OF PUBLIC AND INTERNATIONAL AFFAIRS

Chinese Studies and International Affairs

First two years of the Bachelor of Arts curriculum in Chinese Studies and International Affairs:

	Semester Hours
Engl: Composition—Engl 1 or 1x, 2.....	6
Literature—Engl 51-52 or 71-72.....	6
*Language:	12
Geog: Geog 52.....	3
§Math, Science: B Sc 3-4 or 11-12; Chem 3-4; Geol 1-2; Math 3, 6; Phys 1, 2, or 9-10; or Stat 51, 52.....	6-8
†PE:	4
Social Studies: Econ 1-2; Hist 40, 71-72; and P Sc 5-6.....	21
‡Elective:	4-6
Total.....	64

Public Affairs

First two years of the Bachelor of Arts curriculum in Public Affairs:

	Semester Hours
Engl: Engl 1 or 1x, 2.....	6
*Language:	12
Math, Science: B Sc 3-4 or 11-12; Chem 3-4; Geol 1-2; Math 3, 6; Phys 1, 2, or 9-10; or Stat 51, 52.....	6-8
†PE:	4
Social Studies: Econ 1-2; Hist 39-40, 71-72; and P Sc 5-6.....	24
‡Elective:	10-12
Total.....	64

TERMINAL CURRICULUM

The satisfactory completion of 64 semester hours is required in the following terminal curriculum leading to the degree of Associate in Arts. Although the

* See page 77 for foreign language requirement.

† See pages 76-77 for physical education requirement.

‡ Credit is not given for courses elected in Physical Education.

§ This requirement may be satisfied by 6 hours of Mathematics, by 3 hours of Mathematics plus Stat 51, or by 6 to 8 hours of science.

requirements for this curriculum are equivalent to 4 academic semesters of full-time study, prerequisites in Accounting necessitate a longer period of study for most students. Students in this curriculum must spend the last 15 hours in residence in Columbian College.

Accounting

	Semester Hours
Acct: Acct 1-2, 101, 111, 121-22, 161, 171, 181, 191, 193.....	33
B Ad: B Ad 131, 161, 162.....	9
Econ: Econ 1-2.....	6
Engl: Engl 1 or 1x, 2.....	6
*PE:	4
†Elective: To be selected with the approval of the adviser.....	6
Total.....	64

Upper Division

A STUDENT working toward a Bachelor's degree in the arts or sciences who has 64 or more acceptable semester hours, whether earned in this University or transferred from another institution, is registered in the upper division of Columbian College. (For transfer from lower division to upper division, see page 77.) It is assumed that he has met the requirements of the lower division *Arts and Letters* or *Science* curriculum. If he has not, he must begin to make up his deficiencies immediately upon admission and continue to carry courses to this end until all requirements are met.

THE BACHELOR'S DEGREES

Columbian College offers programs leading to the degrees of Bachelor of Arts, Bachelor of Science, and Bachelor of Science in Medical Technology.

In cooperation with the School of Medicine a seven-year curriculum leading to the combined degrees of Bachelor of Arts and Doctor of Medicine is offered.

REQUIREMENTS FOR THE DEGREES

RESIDENCE

A minimum of 30 semester hours, including at least 12 hours in the major field, must be completed in residence in the upper division of Columbian College. This requirement applies to students transferring within the University as well as to students transferring from other institutions. Summer work may be counted in residence, but in no case may the period of residence aggregate less than thirty weeks. Unless special permission is granted by the Dean to pursue work elsewhere, the work of the senior year must be completed in residence.

* See pages 76-77 for physical education requirement.

† Credit is not given for courses elected in Physical Education.

For the regulation governing students who are absent from the University for one semester or more, see "Continuous Registration," page 47.

CURRICULUM REQUIREMENTS

At least 60 semester hours beyond those of the appropriate lower division curriculum and the satisfactory completion of the major are required. Each program must be approved by the major adviser and by the Dean.

At least 24 of the last 60 hours must be taken in subjects not included in the major field or department. The student should consult his major adviser at each registration concerning his choice of electives.

Except for premedical and medical technology students, not more than 12 hours of professional courses (i.e., courses offered in units of the University other than *Columbian College*) may be included. The election of professional courses must be approved by the Dean's Council prior to registration. Ordinarily courses in Physical Education and technical courses in Education will not be approved toward a degree.

A change in degree candidacy (e.g., from Bachelor of Arts to Bachelor of Science) requires the permission of the Dean. The degree requirements effective at the time the change is approved must be met.

Each student must select and file with the Dean a choice of major upon entering the upper division. He may change the major only with the consent of the Dean and of the department or committee concerned, and must meet the requirements for the new major in effect at the time the change is approved.

First-group courses may be required as prerequisites to the major, but because of their introductory character they may not be counted as part of such programs. (See "Explanation of Course Numbers," pages 179-80.)

Students transferring from other institutions or from other schools, colleges, or divisions in this University, with major requirements wholly or substantially met, must complete satisfactorily at least 12 semester hours of approved work in the major field in the upper division of *Columbian College*. This work will count as part of the minimum residence requirement.

Examination for Waiving Curriculum Requirements.—A required course may be waived and admission to an advanced course granted by passing of a waiver examination. Passing this examination does not entitle the student to any hours of credit. Written request to take the examination should be made to the Dean and the required fee paid at the office of the Cashier (see page 30) before taking the examination.

INDEPENDENT STUDY PLAN

A junior or senior of demonstrated capacity, with a special interest in the subject matter of a regularly listed course, may be permitted to undertake independent study *in residence* under the personal direction of the instructor, in accordance with the rules of the appropriate department and with the approval of the Dean. Credit under this plan is limited to the specific semester hours of credit designated for each course in the list of courses of instruction. It assumes frequent and regular conferences between the student and the instructor.

BACHELOR OF ARTS

The work of the junior and senior years, including a major in one of the following fields, must be approved by the major adviser and by the Dean.

American Civilization
 American Literature
 Anthropology
 Applied Mathematics
 Applied Statistics
 Art History and Theory
 Biology
 Botany
 Chemistry
 Classical Archeology and Greek
 Classical Humanities
 Dramatic Art
 Economics
 English Literature
 Fine Arts
 French Language and Literature
 Geography
 Geology
 Germanic Languages and Literatures
 History
 Journalism

Latin
 Latin American Studies
 Mathematical Statistics
 Mathematics
 Music:
 Applied Music
 Music History and Literature
 Music Theory
 Philosophy
 Physics
 Political Science
 Psychology
 Religion
 Russian Language and Literature
 Sociology
 Spanish American Literature
 Spanish Language and Literature
 Speech Communication
 Speech Pathology and Audiology
 Zoology

COMBINED DEGREES OF BACHELOR OF ARTS AND DOCTOR OF MEDICINE

A candidate for the combined degrees of Bachelor of Arts and Doctor of Medicine must: (1) complete the Medical School entrance requirements; (2) fulfill the Arts and Letters curriculum of the lower division requirements (see page 78); (3) accumulate 94 semester hours in the liberal arts, including a minimum of 30 in the upper division of Columbian College; (4) obtain the approval of the Dean of Columbian College at the time of entering the School of Medicine; (5) obtain the recommendation of the Dean of the Medical Center at the completion of all prescribed courses in the first year of the School of Medicine, at which time the degree of Bachelor of Arts will be conferred (professional work taken at another institution will not satisfy the major requirement for the combined degrees); (6) maintain throughout the entire course the scholarship level required for graduation.

BACHELOR OF SCIENCE

The work of the junior and senior years, including a major in one of the following sciences, must be approved by the major department and by the Dean.

Biological Sciences

Biology
 Botany
 Zoology

Physical Sciences

Applied Mathematics
 Applied Statistics
 Chemistry
 Geology
 Mathematical Statistics
 Mathematics
 Physics

THE UNDERGRADUATE MAJOR

There are two types of undergraduate majors: the field-of-study major and the departmental major. Two majors, Latin American Studies and Classical Archeology and Greek, although interdepartmental in nature, are governed by the regulations of the Departmental Major.

Field-of-Study Major

Each Field-of-Study Major covers a carefully worked out field of coordinated study and is under the supervision of the appropriate department and the Columbian College Committee on Studies.

The Field-of-Study Major requires no specific program of courses, although the student is required to meet the over-all general requirements for the degree (at least 124 semester hours of satisfactory work). Ability to pass the Major Examination is assumed to be a convincing demonstration that the student possesses the breadth, depth, and quality of knowledge of his major usually defined in terms of semester hours, courses, and grades. A pamphlet on each field is obtainable from the departmental chairman. The prospective student should place himself under the direction of the appropriate adviser immediately upon completing lower division work and beginning his junior year.

The Field-of-Study Major places special emphasis on the intellectual development of the individual student. Programs in the same major may vary, depending upon the individual student's background, previous study, and aptitudes. The student is expected to consult his adviser frequently, and the special proseminar offered in some fields gives him further opportunity for individual advice and direction in pursuing a program especially adapted to his needs and abilities. A close student-adviser relationship is essential for the student's success under the Field-of-Study Major plan.

The following Field-of-Study Majors are offered: American Civilization, American Literature, English Literature, French Language and Literature, History, Philosophy, Religion, Russian Language and Literature, Spanish American Literature, Spanish Language and Literature.

PROSEMINAR IN THE MAJOR

A proseminar is offered in most fields to help the student acquire a coordinated knowledge of his field through reading, study, and laboratory exercises. It is a presentation of the content and methods of the major field as a whole through the organization and coordination of the knowledge obtained in the various formal courses in the major subject and of material not usually included in such courses. This course is not required, but, if elected, strict attendance is essential. Six semester hours, but no qualitative grade, may be assigned. When registered in this course, the student has the privilege of visiting, subject to the approval of the instructor, any other appropriate course offered in the College. (Regular attendance in a course, either for credit or as an auditor, requires registration and payment of tuition.) Proseminars are open only to the student who has been accepted as a candidate under that specific major.

THE MAJOR EXAMINATION

The Major Examination will normally be taken at the close of the senior year; a student on a limited schedule may take it no earlier than one calendar year before graduation. A student who fails to pass a Major Examination may, at the discretion of the Committee on Studies, be re-examined at a later regular major-examination period. The Committee on Studies has general supervision of the preparation, reading, and grading of Major Examinations. Major Examinations are held each semester on dates fixed by the department or departments concerned, but in no case later than January 15 for the fall semester, May 15 for the spring semester, and August 26 for the summer session.

Departmental Majors

Departmental Majors, unlike Field-of-Study Majors, are defined in terms of credit hours, required courses, and the attainment of High Pass or Honors grades in half of the second-group courses taken in the major field. The minimum specific requirements for Departmental Majors are listed below the staff of instruction of the department concerned. The Chairman of the Department, or designated departmental adviser, should be consulted at registration concerning the student's program of courses; and the entire program, including electives, must be approved by the Department. The student is also expected to consult the Chairman or adviser in all matters affecting his program of studies, such as changes, substitutions, or withdrawals, and especially concerning his progress in his courses. A close student-adviser relationship is desirable.

Departmental Majors are offered in the following: Anthropology; Applied Mathematics; Applied Statistics; Art History and Theory; Biology; Botany; Chemistry; Classical Archeology and Greek (interdepartmental); Classical Humanities; Dramatic Art; Economics; Fine Arts; Geography; Geology; Germanic Languages and Literatures; Journalism; Latin; Latin American Studies (interdepartmental); Mathematical Statistics; Mathematics; Music (Music History and Literature, Music Theory, Applied Music); Physics; Political Science; Psychology; Sociology; Speech Communication; Speech Pathology and Audiology; Zoology.

BACHELOR OF SCIENCE IN MEDICAL TECHNOLOGY

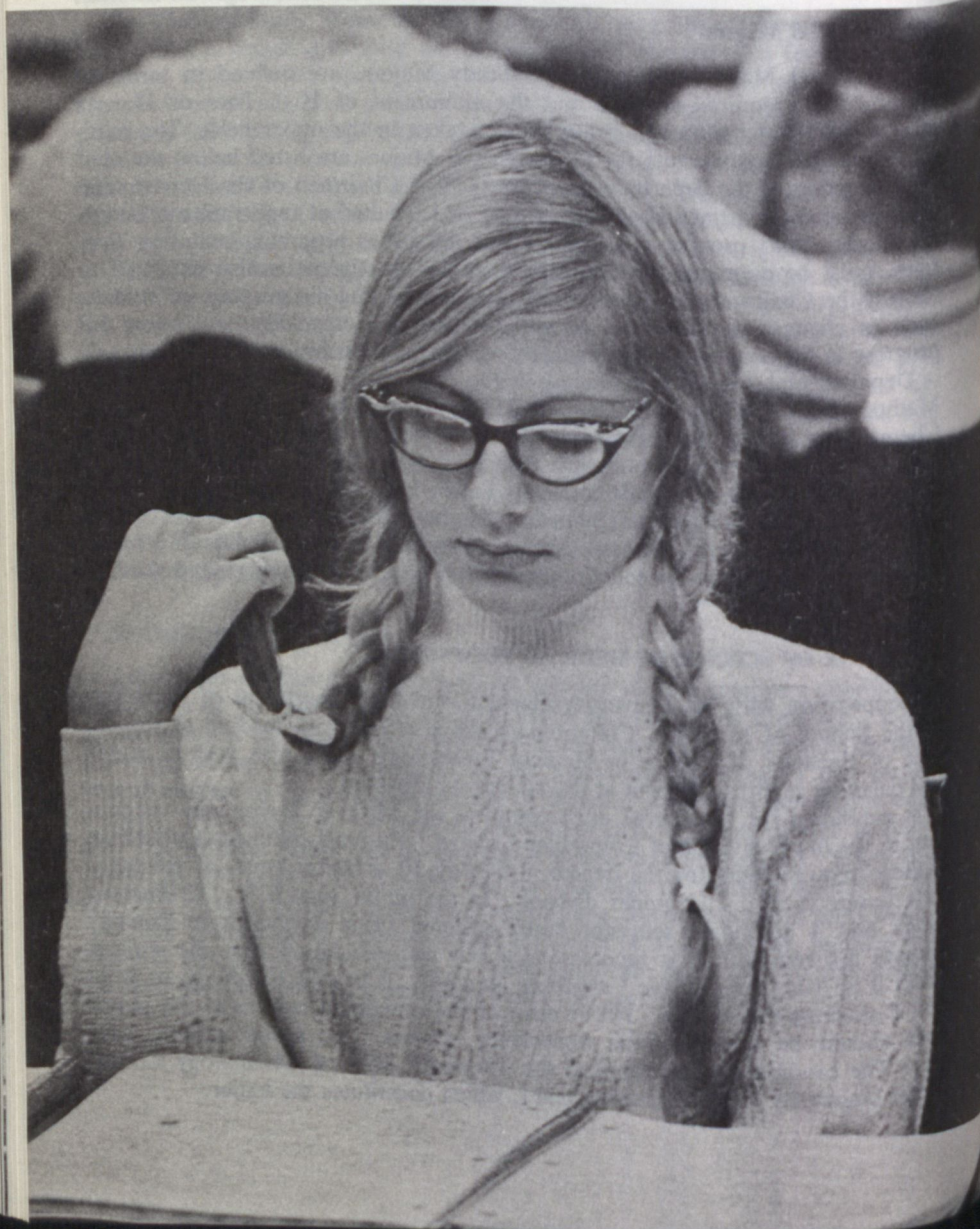
In cooperation with the University Hospital and the Department of Pathology of the School of Medicine, Columbian College offers work leading to the degree of Bachelor of Science in Medical Technology, the fourth year of which (12 calendar months) is spent at the University Hospital.

A candidate for the degree must complete the Medical Technology curriculum in the lower division of Columbian College. He must fulfill the Columbian College requirements for the degree, including 30 semester hours of residence (the junior year) in the upper division. In the junior year B Sc 112 *Bacteriology* and 4 additional semester hours selected from second-group Zoology courses are required; it is recommended but not mandatory that the student select B Sc 104 *Comparative Vertebrate Anatomy*, B Sc 148 *Histology*, or B Sc 164 *Vertebrate Physiology*. All or most of the remaining courses in the junior year should be selected from nonscience courses, i.e., social studies, arts, etc. The candidate must complete the 12-month Medical Technology Course in the University Hospital (senior year), which constitutes the major.

Each candidate must make application to take the 12-month Medical Technology Course at the University Hospital; this should be done early in the junior year. While admission to the Columbian College degree program does not assure acceptance into the Medical Technology Course, George Washington University students are given preference.

A number of scholarships are provided by the University Hospital for the students enrolled in the fourth (senior) year of the degree program.

For further information concerning the Medical Technology program call 331-6386.



GRADUATE SCHOOL OF ARTS AND SCIENCES

Dean A.E. Burns

Assistant Dean W.F.E. Long

FACULTY, CONSULTANTS IN RESEARCH, AND FIELD OF STUDIES CONSULTANTS

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HISTORY AND ORGANIZATION

The Graduate School of Arts and Sciences is responsible for advanced study and research leading to Master's degrees and the degree of Doctor of Philosophy in the arts and sciences. Graduate programs at George Washington University were first formally organized under a Graduate School in 1905, following several decades of gradual growth in a number of departments. In 1930 the Graduate School was discontinued. Columbian College, the University's liberal arts college, then assumed responsibility for the Master of Arts and Master of Science degrees, and a newly created Graduate Council administered all Doctor of Philosophy programs. Professional schools took responsibility for advanced degrees in the professional fields.

In 1966 the Graduate Council and the Graduate Division of Columbian College were consolidated into a new Graduate School of Arts and Sciences. All graduate programs in the arts and sciences leading to the degrees of Master of Arts, Master of Fine Arts, Master of Music, Master of Science, Master of Science in Forensic Science, and Doctor of Philosophy are under the Graduate School.

In addition, a Master of Philosophy degree is awarded by the School, upon recommendation of the appropriate department, to doctoral candidates who have successfully completed the General Examination for the Doctor of Philosophy degree and have begun work on the dissertation.

The School is under the direction of the Graduate Faculty of Arts and Sciences. It is the responsibility of the Faculty to set the requirements for admission to the School, to provide courses and programs of study and research for its students, to establish academic standards for its degrees, to recommend to the Board of Trustees the awarding of degrees, to lay down regulations as needed for the operation of the School, and generally to supervise its activities.

The administration of the School is vested in the Dean, who is Chairman of the Dean's Council, which is responsible to the Faculty of the School for all policy matters. The President of the University and the Vice President for Academic Affairs are ex officio members of the Faculty and the Dean's Council.

ADMISSIONS REQUIREMENTS

Application forms for admission to graduate study are obtained from the Office of the Dean of the Graduate School of Arts and Sciences. When completed, these application forms must be submitted to this Office, together with college transcripts and letters of reference.

Applicants must have academic backgrounds of excellence, usually with majors, or equivalent, in the fields in which they intend to study for advanced degrees. Normally, at least a *B* average (or equivalent) from an accredited college is required. With evidence of special promise, such as high Graduate Record Examination scores, an applicant may be accepted whose academic record falls short of *B*. The minimum does not assure automatic acceptance. The departments may, and often do, set higher admissions standards. Moreover, the number of spaces available for new graduate students limits the number that can be accepted. Students who apply in their senior year must have completed their baccalaureate work before registration in the Graduate School.

Application for Admission.—Students applying for admission for the fall semester must file completed applications by February 15. The deadline for admission for the spring semester is November 1. Later application diminishes the prospects for admission.

Readmission.—A student who has failed to maintain continuous registration and wishes to resume his graduate program must file an application for readmission. Readmission is not guaranteed, and the application is subject to review by the department concerned and the Dean. The student may be required to take qualifying examinations on the course work completed. Application forms for readmission are available in the Graduate School Office.

REGULATIONS

Regulations regarding REGISTRATION, FEES AND FINANCES are stated on pages 27–33; other University regulations, on pages 43–51.

GRADES

Grades for graduate work are *A*, excellent; *B*, good; *C*, minimum pass; *F*, fail; *I*, incomplete; *W*, authorized withdrawal; *CR*, credit.

The symbol *I* (incomplete) indicates that a satisfactory explanation has been given to the instructor for the student's failure to complete the required work for a course. The "incomplete" must be made up before the lapse of one calendar year. An "incomplete" which is not removed within one calendar year is automatically changed to an *F*.

The grade of *I* is also given for all thesis and dissertation preparation courses until the thesis or dissertation is completed, and for *Advanced Reading and Research* (usually numbered 398) courses until the General Examination is successfully completed in its entirety.

Upon the satisfactory completion of the thesis, dissertation, or General Examination the grade *I* is changed to *CR*. The *I* in these instances is allowed to stand as long as necessary without being changed to an *F*.

SCHOLARSHIP REQUIREMENTS

Graduate students are expected to maintain a minimum accumulative grade average of *B* (3.00) in all course work in the program of studies. Individual departments may require a higher average. The fields of Art History and Theory, English, History, and Psychology require a 3.25 average.

In the case of a student who receives a grade of *F* for a course in his program of studies, the Graduate School will require a departmentally approved written statement, justifying the student's continuance in the Graduate School and outlining the program to be followed. Continuation is contingent upon the Dean's approval. A course in the program of studies for which an *F* is received cannot be subsequently removed from the program even though another course is taken as a substitute.

A student may not repeat for credit a course in which he has received a grade of *C* or above unless required to do so by the department concerned. A written statement to this effect must be submitted for approval to the Dean's Office by the appropriate departmental chairman, and filed with the Registrar.

A graduate student may take an advanced undergraduate course (courses numbered 101–200) for graduate credit only upon the approval of the Dean and the department at the time of registration. Such approval is granted only with the provision that students complete additional work in order to receive graduate credit.

PROGRAM OF STUDIES

The program of studies must be approved by the departmental adviser and filed in the Graduate School Office no later than November 1 for graduate students entering in the fall semester, or March 15 for graduate students entering in the spring semester. A program of studies may be revised, when necessary, by obtaining the approval of the departmental adviser and the Dean. The revision must be filed in the Graduate School Office.

CONTINUOUS REGISTRATION

All students must maintain continuous registration while working toward a degree, except during the summer session. If continuous registration is not maintained, the student is dropped from the degree program unless leave of absence is granted by the Graduate School. A Master's degree candidate who has completed his course work and has already registered for thesis (299–300), must maintain continuous registration, if more time is needed to complete the thesis by paying the continuous registration fee, which is equivalent to one semester hour. Doctor of Philosophy students see "Academic Work Load," pages 97–98.

LEAVE OF ABSENCE

If a student is temporarily unable to continue his program of studies, he may request leave of absence for a specific period of time, not to exceed one calendar year. An exception is made for students granted Military Leave. A student who is called to active duty (or who enlists) may be granted Military Leave (see pages 47–48) for the duration of his period of military duty upon presentation to the Graduate School of a copy of his orders and a request for such leave. When the period of leave has expired, it is the student's responsibility to notify the Graduate School at least two months in advance of a given registration period of his intention to reregister. If he fails to reregister, his candidacy will be terminated.

WITHDRAWAL

Graduate students who intend to withdraw from the Graduate School should inform the School in writing. The last day for *complete* withdrawal without academic penalty is at the end of the eighth week of classes.

GRADUATION REQUIREMENTS

All students must file an "Application for Graduation" form and pay the required graduation fee at the time of registration for the last semester or summer session of the final year in which they intend to graduate. The student must be registered in the Graduate School during the semester he plans to graduate.

Master's and doctoral candidates may graduate in June, February, or September. A student who has completed the requirements for a degree but has not yet been awarded the degree will be issued a letter to this effect upon request.

DEGREES

Listed below are the degree programs of the Graduate School of Arts and Sciences and the specific degrees offered, by field. The programs are directed by the departments concerned. Degree programs which bridge two or more departments are directed by committees composed of members of the departments concerned. For further information write to the Dean or the chairman of the appropriate department.

The graduate course work offered in support of these degrees is shown by department in this CATALOGUE.

GRADUATE FIELDS

Subject	Degrees Offered
I. Humanities	
American Civilization	M.A. Ph.D.
American Literature	M.A. Ph.D.
Art:	M.F.A.
Ceramics	
Graphics	
Painting	
Sculpture	
Art History and Theory	M.A.
Dramatic Art	M.F.A.
English Literature	M.A. Ph.D.
French Language and Literature	M.A. Ph.D.
Germanic Languages and Literatures	M.A. Ph.D.
Linguistics	M.A.
Museology	M.A.
Music:	Mus.M.
Applied Music	
Conducting	
Music Composition	
Music Theory	
Musicology	M.A.
Philosophy	M.A.
Religion	M.A.
Religious Education	M.A.
Russian Language and Literature	M.A.
Spanish American Literature	M.A. Ph.D.
Spanish Language and Literature	M.A. Ph.D.
II. Social Sciences	
Anthropology	M.A.
Economics	M.A. Ph.D.
Geography	M.A.

Subject	Degrees Offered	
History	M.A.	Ph.D.
*International Relations		Ph.D.
Latin American Studies	M.A.	
Political Science	M.A.	Ph.D.
Sociology	M.A.	Ph.D.

III. Physical and Mathematical Sciences

Applied Statistics	M.S.	
Chemistry	M.S.	Ph.D.
Forensic Science	M.S. in Forens.S.	
Geochemistry	M.S.	Ph.D.
Geology	M.A., M.S.	Ph.D.
Mathematical Statistics	M.A.	Ph.D.
Mathematics	M.A.	Ph.D.
Physics	M.A.	Ph.D.

IV. Biomedical and Related Sciences

Anatomy	M.S.	Ph.D.
Biochemistry	M.S.	Ph.D.
†Biological Sciences	M.S.	Ph.D.
Biophysics		Ph.D.
Genetics	M.S.	Ph.D.
Human Ecology		Ph.D.
Microbiology	M.S.	Ph.D.
Mycology	M.S.	
Pathology	M.S.	Ph.D.
Pharmacology	M.S.	Ph.D.
Physiology	M.S.	Ph.D.
Psychology	M.A.	Ph.D.
Speech Pathology and Audiology	M.A.	

COMBINED MASTER OF SCIENCE AND DOCTOR OF MEDICINE

Students in the School of Medicine may apply for the combined degrees of Master of Science and Doctor of Medicine. They must meet the requirements for admission to the Graduate School of Arts and Sciences, and they must be recommended by the chairman of the department and the deans of the Graduate School of Arts and Sciences and the Medical Center.

The Master of Science program consists of a minimum of 30 semester hours of credit and the fulfilling of the language requirement (see pages 96-97). A maximum of 12 semester hours of credit for graduate-level courses *completed as a part of the Doctor of Medicine degree curriculum* (and not already applied toward the Bachelor's degree) will be allowed in fulfillment of the requirements of the Master of Science degree. The remaining 18 semester hours of course work, which includes a thesis, must be work in the basic medical sciences normally required for a Master of Science degree in the Graduate School of Arts and Sciences.

* The School of Public and International Affairs offers a Master of Arts field in International Affairs.

† Biology, Botany, and Zoology.

REQUIREMENTS FOR THE DEGREES

THE MASTER'S PROGRAMS

Most of the requirements listed below are applicable to candidates for the degrees of Master of Arts, Master of Fine Arts, Master of Music, Master of Science, and Master of Science in Forensic Science.

1. *Academic Work Load.*—A minimum of 30 semester hours of approved graduate work is required for the Master's degrees. This includes 24 semester hours of course work and 6 semester hours of thesis preparation. Individual departments may set requirements above this minimum. Upon approval, some portion of these requirements may be taken in courses offered by the Consortium of Universities of the Washington Metropolitan Area, Inc., or another degree-granting division of this University. A maximum of 6 semester hours may be transferred from another accredited college or university (see below). No work taken to make up deficiencies may be included in the 30 semester hours required for the Master's degree. A Master's degree program without the thesis, but with 36 semester hours of approved graduate course work, is an option in several departments on an individual student basis.

Full-time Master's students are expected to register for 9 to 12 semester hours of graduate work a semester and complete the degree requirements in 3 to 4 semesters*. Part-time students are expected to register for a minimum of 6 semester hours a semester and complete the degree requirements in no more than 6 semesters. The summer sessions are not counted in computing the number of semesters a student has been in residence. No more than 15 semester hours may be taken during any one semester. These requirements do not apply when a student has fewer than 9 semester hours (for full-time students) or 6 semester hours (for part-time students) remaining to complete his program. A student who finds it necessary to extend his program beyond 6 semesters (3 years) must make a written request for an extension of time.

2. *Transfer of Credit.*—A maximum of 6 semester hours of graduate course work may be approved for transfer to the Graduate School from another division of the University or another accredited college or university under the following conditions: the course work must be approved as a part of the student's program of studies, it must not have been applied to the completion of requirements for another degree, it must be graduate-level course work, it must have been taken within the past two years, and the student must have received a grade of B or better. A student seeking to transfer credits from the Division of University Students may transfer only those credits taken during the semester in which he applies and is accepted to the Graduate School of Arts and Sciences, provided the courses are approved and meet the above requirements. This action must be approved on a "Request Form" by the departmental adviser and the Dean. A transcript of the course work must be on file before the request can be considered.

3. *Foreign Language Requirements.*—A candidate for the degree of Master of Arts, Master of Science, or Master of Music must pass a reading examination in a foreign language before he completes 15 semester hours of graduate course work. The student should contact the appropriate language department to make arrangements to take the examination, or he may register for and suc-

* Master of Science in the field of Pathology requires a longer period of time, see page 328.

successfully complete a reading course for nonmajor students. The language selected by the candidate must be approved by his department. No candidate is permitted to take language reading examinations or register for language reading courses more than 3 times. A candidate whose field is a foreign language or literature may not select that language to meet this requirement.

A graduate student whose native language is other than English may not select his native language to meet the foreign language examination requirement. He may select English to fulfill the requirement with the approval of his department. The student should contact the English Department to make arrangements to take the examination in English.

A candidate for the degree of Master of Fine Arts may register for a methods course selected by his department instead of taking a foreign language reading examination.

4. *The Thesis*.—All candidates for Master's degrees must complete a thesis, which is equivalent to 6 semester hours of graduate work. The thesis may be of a research, expository, critical, or creative type. The main purpose of a Master's thesis is to demonstrate the student's ability to make independent use of the information and training acquired through his other disciplines and to furnish objective evidence of his constructive powers in his chosen field. The student registers for 6 semester hours of thesis research and must complete the thesis no later than two calendar years after his initial registration for thesis research. If the thesis is not completed within this time limit, the student must reregister for 6 semester hours of thesis research. Registration for thesis research entitles the student to the advice and direction of the member of the faculty under whom the thesis is to be written. The thesis subject must be approved by the professor who will be directing it and filed in the Graduate School Office prior to or at the time of registration for thesis research. The thesis, in its final form with one copy and a certificate of approval signed by the thesis director and at least one departmental reader, must be presented to the Dean no later than the date announced in the University Calendar. All theses must meet the form, style, and other requirements set forth in a pamphlet, *Information Concerning Theses and Dissertations*, available in the Office of the Dean.

5. *Master's Comprehensive Examination**.—Master's degree candidates must pass a Master's Comprehensive Examination in the major subject. Examinations are held on dates fixed by the departments, so that results can be filed in the Graduate School Office the day before the faculty meets to approve the list of graduates (approximately two weeks before graduation).

A student who fails to pass the Master's Comprehensive Examination may, in exceptional circumstances, and with the approval of the department and the Dean, repeat the Examination, but only after the lapse of one semester. If he fails a second time, no further opportunity to take the Examination is permitted.

THE DOCTOR OF PHILOSOPHY PROGRAM

The minimum requirements for the doctoral program are as follows:

1. *Academic Work Load*.—The Doctor of Philosophy degree program requires registration for a minimum of 48 semester hours beyond the baccalau-

* Not applicable to the degree of Master of Science in Forensic Science.

reate and the successful completion of the General Examination prior to registration for *Dissertation Research*. Of these 48 semester hours, 24 hours of acceptable graduate work may be transferred from work at the Master's degree level at George Washington University or another accredited college or university. A prospective student for the doctoral program may by-pass the Master's degree with the approval of his department.

A full-time student is expected to register for 9 to 12 semester hours a semester until he has less than 9 semester hours remaining to complete the 48 hours required prior to the General Examination. When at least 40 of the 48 required semester hours have been completed, the student must register in the following semester for sufficient semester hours to fulfill the 48-hour requirement. A part-time student is expected to register for 6 semester hours a semester until the 48-hour requirement has been fulfilled. With departmental approval, a portion of the 48 required semester hours may be in *Advanced Reading and Research* (usually numbered 398), a course for students preparing for the General Examination.

If the student has not successfully completed his General Examination upon completion of the 48-semester-hour requirement, he must maintain continuous registration (one semester hour) until he successfully completes the General Examination.

The Master of Philosophy degree may be awarded upon departmental recommendation to doctoral students who have successfully completed the General Examination for the degree of Doctor of Philosophy and have begun work on the dissertation.

Following successful completion of the General Examination, the student must register for 24 semester hours of *Dissertation Research* (usually numbered 399). Full-time students register for 9 to 12 semester hours a semester for 2 semesters, and for sufficient hours in the third semester to complete the 24-semester-hour requirement. Part-time students must register for 6 semester hours a semester for 4 semesters. If the dissertation has not been completed during the time the student has registered for the required 24 hours, he must register for 3 semester hours of *Dissertation Research* each succeeding semester until the satisfactory completion of the dissertation and the successful completion of the final Oral Examination.

2. *Tool Requirements.*—The tool requirement options are as follows:

- (a) two foreign language reading examinations;
- (b) one foreign language reading examination and an examination in one of the following—mathematics, statistics, or computer programming;
- (c) high-level proficiency in one foreign language.

The Doctoral Program Committee makes the most appropriate choice.

The examination in one tool requirement must be passed by the beginning of the second semester following admission; the examination in the second tool requirement must be passed before completion of the General Examination. All tool requirements must be completed before completion of the General Examination. These requirements may be fulfilled by registering for and successfully completing appropriate tool courses for nonmajor students.

A doctoral student whose native language is other than English may not elect his native language to meet the foreign language examination requirement. He may elect English to fulfill one of the two language requirements (see above), with the approval of his department. The student should contact the English Department to make arrangements to take the examination in English.

A doctoral student may omit a tool preparation course at George Washington University if he has had a similar course at another college or university. However, his proficiency in that tool must be validated by an examination at this University.

Further details for meeting the various tool requirements may be obtained from the Office of the Dean.

3. *The General Examination.*—No later than the semester following the completion of the course requirements, the student is required to complete the General Examination. In some departments as many as two of the several examinations which together constitute the General Examination may be "written off." This is done by completing a year course and by passing a special examination covering the subject matter. The examinations in other fields are usually from 5 to 6 hours in length. A "cumulative examination" system is in effect in the fields of Chemistry and Physiology. Students in these fields should consult these departments for information about this system.

4. *The Dissertation.*—A doctoral dissertation is required of each candidate as evidence of his ability to perform scholarly research and to interpret its results. The candidate's dissertation subject and plan must be approved by his Director of Research and by two members of his Doctoral Program Committee. This is done usually after the General Examination has been passed but before actual research has begun.

No later than the date specified in the University Calendar, the candidate must submit to the Dean the original and one copy of the dissertation and an abstract for inclusion in the announcement of the examination and for reproduction by University Microfilms, Inc.

When the dissertation has been approved by the Director and two members of the Doctoral Program Committee and filed with the Dean, the candidate is given an oral examination which is open to the public. A committee of examiners (composed of Graduate School Faculty and, when appropriate, outside scholars) conducts the examination. If the candidate passes, he is recommended by the Graduate School for the degree of Doctor of Philosophy.

Detailed information regarding regulations for the form and reproduction of the dissertation is available in the Office of the Dean. The successful candidate for the doctorate is required, before receiving his degree, to pay a fee to cover the expense of printing the abstract of his dissertation, and for the basic service rendered by University Microfilms, Inc.

POSTDOCTORAL STUDY

George Washington University doctoral graduates may continue any studies in the University without payment of tuition, and enjoy all University library privileges. Such graduates are required to pay only the usual "continuous registration" fee in order to establish their active membership in the University. The use of laboratory space and equipment is contingent upon availability, and the cost of all laboratory or special library material is paid by the graduate. Special arrangements for such privileges must be made with the Dean well before the semester in which the graduate wishes to register. Postdoctoral work taken under this privilege may not be applied toward any degree offered by the University.

FELLOWSHIPS, ASSISTANTSHIPS, TRAINEESHIPS

A limited number of graduate teaching fellowships available in most departments of instruction are open to students registered in the Graduate School of Arts and Sciences. In many departments of instruction graduate teaching fellows are appointed to assist in the academic program. Applicants for these fellowships should inquire directly of the chairman of the department concerned regarding vacancies, details of appointment, and the kind of personal data to be supplied for consideration. Appropriate forms are available at the Office of the Graduate School.

In addition, the Graduate School of Arts and Sciences has a number of fellowships. Applicants should write directly to the Dean for information and application forms.

The University is participating in the following Government fellowship programs: National Science Foundation Fellowships and Traineeships, United States Public Health Service Training Grants, and National Defense Education Act (Titles IV and VI) Fellowships. Qualified students should write directly to the Dean of the Graduate School of Arts and Sciences for information and application forms for these fellowships.

Completed applications for all fellowships, assistantships, or traineeships must be filed by February 15. Scores on the Graduate Record Examination are required.



SCHOOL OF EDUCATION

Dean Rodney Tillman

Assistant Deans R.E. Baker, B.S. Root

FACULTY

Professors J.G. Allee, Jr., G.L. Angel, R.E. Baker, Perry Botwin, J.L. Breen, Elizabeth Burtner, W.T. Carroll, Mary Ellen Coleman, V.J. DeAngelis, H.G. Detwiler, L.H. Elliott, R.G. Hanken, Anthony Marinaccio, Martha Rashid, B.S. Root, Carol St. Cyr, Daniel Sinick, Loretta Stallings, Rodney Tillman

Associate Professors J.G. Boswell, Marcella Brenner, Bertice Cornish, R.S. Cottrell, Jr., R.J. Frankie, Lyndale George, Eva Johnson, Virginia Kirkbride, A.D. Kirsch, Margaret McIntyre, Leonard Nadler, Jeanne Snodgrass, C.E. Vontress, Maida Withers

Assistant Professors Martha Bair, B.P. Berube, Charmaine Ciardi, Gayle Clapp, Gloria Horrworth, Nancy Johnson, Donald Linkowski, Mabel McEwan, Dorothy Moore, Honey Nashman, Wretha Petersen, Ruth Peterson, R.W. Prouty, C.B. Reed, M.G. Van Dyke, Lawrence Winkler, Judith Young

Instructors K.E. Bumgarner, Kayte Fearn, Evelyn Scales, G.D. Wiggs

COMMITTEES*

THE DEAN'S COUNCIL†

1969: J.G. Boswell, M.G. Van Dyke

1970: G.L. Angel, C.B. Reed

1971: H.G. Detwiler, Anthony Marinaccio

COMMITTEE ON GRADUATE STUDIES†

R.E. Baker (*Chairman*), G.L. Angel, J.G. Boswell, Perry Botwin, W.T. Carroll, Bertice Cornish, R.S. Cottrell, H.G. Detwiler, Virginia Kirkbride, A.D. Kirsch, Anthony Marinaccio, Leonard Nadler, Martha Rashid, B.S. Root, Carol St. Cyr, Daniel Sinick, C.E. Vontress

COMMITTEE ON ADMISSION AND ADVANCED STANDING‡

B.S. Root (*Chairman*), Perry Botwin, J.L. Breen, J.Y. Ruth

* The Dean and Assistant Deans of the School of Education are ex officio members of all committees.

† Elected by the Faculty.

‡ Appointed by the Dean.

COMMITTEE ON SCHOLARSHIP

B.S. Root (*Chairman*), Perry Botwin, J.L. Breen

INTRODUCTION

It is the purpose of the School of Education to prepare teachers, counselors, and administrators for leadership responsibilities, and to offer experienced teachers opportunities to extend their education. The School includes the departments of Education, Physical Education, and Special Education. It offers both graduate and undergraduate work. Other departments of the University provide general education and subject-matter courses needed for a well-balanced program of teacher education.

Individually planned programs are provided for liberal arts and other selected graduates who wish to prepare for teaching. The School also provides a wide range of courses to provisional teachers who wish to qualify for teaching certificates and teachers who wish to renew licenses. Degree programs in adult education—employee development, rehabilitation counseling, and student personnel work in higher education are offered.

Laboratory and clinical facilities are provided by the University Reading Center and Speech and Hearing Clinic. In cooperation with public and private schools and a wide variety of social agencies, ample opportunity for field experience is provided.

In addition to a full schedule of weekday courses during the academic year, classes are offered in the evening, on Saturday, and during the summer.

HISTORICAL DEVELOPMENT

The University began offering professional courses for teachers in 1904-5, and in 1907 it established a Division of Education. In 1909, the Division of Education became the Teachers College, which in its early years was concerned largely with teacher preparation on the undergraduate level.

In 1928, the Teachers College became the School of Education, and greater provision was made for advanced study. Graduate enrollment has steadily increased, and today the School has a considerably larger number of graduate than undergraduate students.

EDUCATION FOR TEACHERS

Programs are planned to provide a broad general education, adequate mastery of the content, and professional competence. The relative emphasis placed on each of these depends on the student's teaching-level plan. For example, elementary school teachers, since they teach all subjects, need preparation of greater breadth and less specialization than secondary school teachers.

Four years of full-time study is an acceptable minimum for adequate preparation for teaching. Five years terminating in a Master of Arts in Education degree are needed for superior preparation which will command higher salaries and opportunities for promotion. During the first two years, the student is registered in the lower division of Columbian College of Arts and Sciences, the liberal arts college of the University, where he acquires the background of gen-

eral education so essential to success as a teacher. Here he is assigned a special adviser from the School of Education to assist in planning his program.

REGULATIONS

Regulations concerning ADMISSION, REGISTRATION, FEES AND FINANCES are stated on pages 23-33; other University regulations, on pages 43-51.

ACADEMIC WORK LOAD

Fifteen to 17 semester hours of credit constitute a normal program. A student with a quality-point index of 3.00 or higher may, with the permission of the Dean, enroll for 18 or 19 hours. No student may enroll for more than 19, except by permission of the Committee on Scholarship.

A student employed 15 hours or less a week may carry a normal program of college work.

A student employed from 16 to 25 hours a week may enroll for 12 or 13 hours. With a quality-point index of 3.00 or higher he may, with special permission of the Dean*, enroll for 14 or 16 hours.

A student employed from 26 to 34 hours a week may enroll for 9 or 10 hours. With a quality-point index of 3.00 or higher he may, with special permission of the Dean*, enroll for 11 or 13 hours.

A student employed 35 hours or more a week may enroll for 6 or 7 hours. With a quality-point index of 3.00 or higher he may, with special permission of the Dean*, enroll for 9 or 10 hours.

A student who increases his hours of employment after registration or at any time during a semester must report immediately to the Dean so that his program may be adjusted, if necessary.

The Bachelor's Degrees

THE SCHOOL OF EDUCATION OFFERS PROGRAMS leading to the degrees of Bachelor of Arts in Education and Bachelor of Science in Physical Education.

The program of each student must be approved by a Faculty adviser. Since each student's program is defined by his particular needs, it is important that the student have a clear concept of his major interest in education, and also that he be familiar with the teaching-certificate requirements of the locality in which he expects to teach.

ENTRANCE REQUIREMENTS

Bachelor of Arts in Education and Bachelor of Science in Physical Education.—The satisfactory completion of the appropriate curriculum in the lower division of Columbian College of Arts and Sciences (see pages 80-81), or the equivalent from another accredited education institution, is required. Appli-

* Request forms are available at the Office of the Dean. They should be filled out and returned to the Dean at least two weeks prior to Registration.

cants must, at an admissions interview, exhibit personality traits that give promise of success as a teacher.

REQUIREMENTS FOR THE DEGREES

To be recommended for a degree a student must satisfy the admission, residence, scholarship, and curriculum requirements.

RESIDENCE

Candidates for the Bachelor's degrees must complete satisfactorily while in the School of Education a minimum of 30 semester hours, 9 of which, with the approval of the adviser, may be in off-campus courses of the College of General Studies.

For full details concerning continuous registration, see page 47.

SCHOLARSHIP

For the system of grading and of computing scholarship, see pages 44-46.

In order to graduate, a student must have a quality-point index of at least 2.00.

Probation.—A student who fails to maintain a quality-point index of at least 2.00 is placed on probation. He remains on probation as long as his index is below 2.00, or until his probation is removed by the Committee on Scholarship.

Suspension.—A student on probation who fails to raise his index to 2.00 within the time specified may be suspended.

A student suspended for poor scholarship may, within ten days, appeal his case to the Committee on Scholarship through the Dean. If the case appears to be remediable and the student seems likely to improve his scholarship, the Committee may readmit him on probation. A student denied readmission may again, after a lapse of a calendar year, petition the Committee through the Dean for readmission. A student suspended twice will not be readmitted.

CURRICULUM REQUIREMENTS

In all Bachelor's curricula at least 30 semester hours must consist of courses numbered above 100.

CREDIT/NO CREDIT OPTION (see page 45)

BACHELOR OF ARTS IN EDUCATION

The objective of programs leading to the degree of Bachelor of Arts in Education is to provide (1) general educational backgrounds; (2) functional command of ideas, concepts, knowledge, and skills in one or more teaching fields; (3) mastery of basic professional information and skills adequate for the beginning teacher; and (4) development of attitudes needed for success in teaching.

The general educational backgrounds needed by prospective teachers are obtained through precollege education, college courses, work experience, leadership activities, student campus activities, and off-campus cultural opportunities.

Normally, from 65 to 67 semester hours of the total requirement are completed in the lower division of Columbian College of Arts and Sciences of this University or in an equivalent institution elsewhere (see "Education," page 80). Since the teaching fields differ in content, scope, and complexity, some programs are longer than others. None requires less than 126 hours of satisfactory work, exclusive of required Physical Education.

Work experience, leadership activities, participation in student campus activities, and the utilization of off-campus cultural opportunities.—As part of formal course work and on their own initiative, students of the School of Education are expected to take full advantage of the many opportunities in the Washington area for developing leadership skills. Advisers are available to help students plan these experiences.

NATIONAL TEACHER EXAMINATIONS

All candidates for the degree of Bachelor of Arts in Education are required to take the National Teacher Examinations. Those expecting to graduate in June should take the examinations the previous February or April; those expecting to graduate in February, in July or November. Students expecting to complete degree requirements during the Summer Sessions should take the examinations in April or July.

Students receive individual reports of test scores and may avail themselves of the regular transcript services of the Educational Testing Service. Students must request the Testing Service to send copies of test scores to the School of Education.

Students required to take the examinations must register for them in the Office of the Dean at least thirty days prior to the date of the examination. Details concerning time, place, registration, and fees may be obtained in the Office of the Dean.

TEACHING-FIELD PREPARATION

Teaching-field preparation depends upon the teaching position for which the student is preparing. Those planning to teach in elementary schools need a degree of competency in several fields. Those preparing to teach in junior or senior high schools must demonstrate competency in a major teaching field. A minor teaching field is optional, but recommended. Ordinarily, students preparing to teach in evening schools for adults are required to prove competency in only one teaching field. The student should begin teaching-field preparation while in the lower division of Columbian College.

Teaching-field requirements, developed in cooperation with appropriate departments of the University, include satisfactory completion of prescribed academic courses in one or more fields, a satisfactory score on the special field examination of the National Teacher Examinations*, and satisfactory completion of the prescribed special methods courses.

* Special field examinations of the National Teacher Examinations are available in elementary education; early childhood education; biology and general science; English language and literature; industrial arts; mathematics; chemistry, physics, and general science; social studies; physical education; business education; music education; home economics; and art education.

Students preparing to teach history or geography take the special field examination in social studies.

Students preparing to teach in fields in which special field examinations are not available (language and speech) must obtain a satisfactory score on a special field examination given by the instructor in the special methods course involved.

Prescribed academic courses vary in number in accordance with the scope and complexity of the teaching field and the license requirements of the various states. Minimum academic course requirements for each major teaching field are listed on succeeding pages. Minor teaching-field requirements are somewhat less than those of a major field. Students preparing to teach on the elementary level are advised to use electives to increase their mastery of content in an academic field or an area of specialization.

The prescribed courses in special methods are concerned primarily with methods of initiating, guiding, and evaluating learning experiences dealing with the content of teaching fields. They attempt to bring to the student specific suggestions drawn from the accumulated experience of successful teachers. However, in addition, the courses review the teaching-field content currently in use in schools, and examinations at the end of courses provide the final test of competency in the teaching fields.

PREScribed COURSES IN THE VARIOUS TEACHING FIELDS

Art		Semester Hours
Art 31-32: Survey of Western Art, or		
Art 71-72: Introduction to the Arts in America.....		6
To be selected from second-group Art History courses or any third-group Art History courses open to the under- graduate		6
Art: To be selected from the following.....		27
*Art 21-22: Design I: Basic		
Art 41-42: Drawing I		
Art 51-52: Ceramics I		
Art 57-58: Graphics I		
Art 65-66: Painting I		
Art 81-82: Sculpture I		
Art 121-22: Design II: Structured		
Art 123-24: Design III: Individual Problems		
Art 125-26: Painting II		
Art 127-28: Painting III		
Art 131-32: Ceramics II		
Art 139-40: Design Workshop		
Art 143-44: Serigraphy		
Art 151-52: Ceramics III		
Art 153-54: Graphics II		
Art 157-58: Graphics III		
Art 165-66: Composition		
Art 175-76: Design Projects		
Art 179-80: Sculpture II		
Art 189-90: Sculpture III		
Total.....		39

* Art 21-22 or permission of Department Chairman is prerequisite to all other studio courses.

Biology*

	Semester Hours
B Sc 11-12: Introductory Biology for Science Majors.....	8
B Sc 101-2: Invertebrate Zoology.....	6
B Sc 104: Comparative Vertebrate Anatomy.....	4
B Sc 108: Organic Evolution, or	
B Sc 127: Genetics	3-4
B Sc 163: Human Physiology, or	
B Sc 164: Vertebrate Physiology.....	4
B Sc: Advanced Botany courses as approved by the adviser.....	6
Chem 11-12: General Chemistry	8
Phys 1: General Physics.....	4
Phys 2: Introduction to Modern Physics.....	4
Total.....	47-48

Chemistry

†Chem 11-12: General Chemistry, or	
Chem 15-16: Intensive General and Analytical Chemistry.....	8
†Chem 22: Introductory Quantitative Analysis.....	4
Chem 51-52: Organic Chemistry.....	6
Chem 53-54: Organic Chemistry Laboratory.....	2
Chem 111: Physical Chemistry.....	3
Chem 191: History of Chemistry.....	2
Math 6: Plane Trigonometry.....	3
Math 30: Precalculus	3
Math 31: Calculus of One Variable.....	3
Phys 1: General Physics.....	4
Phys 2: Introduction to Modern Physics.....	4
Total.....	38-42

Dance

Music: As approved by the adviser.....	4-6
PE 49: Human Anatomy.....	3
PE 50: Kinesiology	3
PE 107: Teaching Ethnic Dance.....	1-2
PE 109: Dance Composition I.....	1-2
PE 110: Dance Composition II.....	1
PE 117: Teaching Modern Dance.....	3
PE 118: Dance Production.....	3
PE 119: Creative Dance for Children.....	3
PE 120: Repertory	1
PE 134: Rhythmic Analysis through Creative Movement.....	3
PE 135-36: Survey of Dance History.....	6
PE 157: Dance Technique and Theory.....	1
Speech and	
Drama: As approved by the adviser.....	4-6
Total.....	37-43

* Other courses recommended but not required—Chem 50, or 51-52 and 53-54; Math 31.

† Chem 22 required if Chem 11-12 is elected.

Earth Science

	Semester Hours
B Sc 3: Introductory Biology for Nonscience Majors.....	3
Chem 11-12: General Chemistry	8
Geol 1-2: Introductory Geology.....	6
Geol 14: General Petrology.....	3
Geol 101: History of Geological Sciences.....	3
Geol 122: Structural Geology.....	3
Geol 125: Marine Geology.....	3
*Math 3: College Algebra.....	3
*Math 6: Plane Trigonometry.....	3
Phys 1: General Physics.....	4
Other Courses: To be selected from the following as approved by the adviser	6-8
Anth 186: Physical Anthropology	
Geol 128: Geomorphology	
Geol 141: Introductory Geochemistry	
Geol 147: Chemical Geology in the Earth and Ocean Sciences	
Geol 151-52: Invertebrate Paleontology	
Geol 163: Sedimentation	
Geol 166: Principles of Stratigraphy	
Total.....	45-47

Elementary Education

Art: As approved by the adviser.....	3
Geog 51: Introduction to Geography.....	3
Geog 52: World Regional Patterns.....	3
Hist 71-72: Introduction to American History.....	6
Math 9, 10: General Mathematics I, II.....	6
Music: As approved by the adviser.....	3
Physical Education: As approved by the adviser.....	3
Science: As approved by the adviser.....	9-12
Other Courses: To be selected from the following as approved by the adviser	6
Anth 1-2: Introductory Anthropology	
†Econ 1-2: Principles of Economics	
Hist 39-40: European Civilization in Its World Context	
P Sc 5-6: Introduction to Political Science	
Soc 1-2: Introductory Sociology	
Total.....	42-45

English

Engl 1 or 1x, 2: English Composition.....	6
Engl 52: Introduction to English Literature.....	3
Engl 71-72: Introduction to American Literature.....	6
Engl 101: Expository Writing.....	3

* Additional mathematics is required for some advanced geology courses.

† Recommended for students planning to apply for certification in Virginia.

	Semester Hours
Engl 115: Introduction to English Linguistics.....	3
Engl 127-28: Shakespeare	6
Sp&D 11: Voice and Diction.....	3
*Engl: To be selected from the following as approved by the adviser	9
Engl 133-34: The Romantic Movement	
Engl 135-36: Victorian Literature	
Engl 137-38: The 20th Century	
Engl 153-54: The English Novel	
Engl 155-56: The English Drama	
Engl 161-62: Studies in American Literature	
Engl 163-64: Major American Poets	
Engl 165-66: American Drama	
Engl 167-68: The American Novel	
Engl 170: The American Short Story	
Engl 171-72: Major American Writers	
Engl 173-74: Selected Literary Movements	
Engl 175-76: Special Topics in American Literature	
Engl 177-78: Contemporary American Literature	
Total.....	39

French

Fren 9-10: French Conversation and Composition, or	
Fren 12: French Conversation and Composition (Intensive).....	6
Fren 51-52: Survey of French Literature, or	
Fren 91-92: Analyse de texte.....	6
Fren 103: Pronunciation and Intonation	3
Fren 109-10: Advanced French Conversation and Composition.....	6
French: To be selected from the following.....	18
Fren 119-20: French Literature of the Middle Ages and the Renaissance	
Fren 121-22: 17th Century French Literature	
Fren 123-24: 18th Century French Literature	
Fren 125-26: 19th Century French Literature	
Fren 127-28: 20th Century French Literature	
Fren 193: Cours de style	
Other Courses: Recommended from the following but not required.....	6
Art 109: 19th Century Art in Europe	
Art 110: Contemporary Art	
Engl 115: Introduction to English Linguistics	
Foreign Lang: Other than French as approved	
Fren 103: Pronunciation and Intonation	
Hist 141-42: History of France	
Psyc 115: Psychology of Language and Communication	
Total.....	39-45

* Not required for the minor teaching field.

General Science*

	Semester Hours
B Sc 3-4: Introductory Biology for Nonscience Majors.....	6
†Chem 11-12: General Chemistry, or	
Chem 15-16: Intensive General and Analytical Chemistry.....	8
†Chem 22: Introductory Quantitative Analysis.....	4
Phys 1: General Physics and	
Phys 2: Introduction to Modern Physics, or	
Phys 9-10: Introduction to Astronomy.....	6-8
‡Science: Additional courses as approved by the adviser.....	10
Math: To be selected from the following.....	9
Math 3: College Algebra	
Math 6: Plane Trigonometry	
Math 30: Precalculus	
Math 31: Calculus of One Variable	
Math 32: Calculus of Several Variables	
Math 33: Calculus of Vector Functions	
Total.....	41-47

Geography

Geog 51: Introduction to Geography.....	3
Geog 52: World Regional Patterns.....	3
Geog 103: Cartography and Graphics.....	3
Geog 104: Quantitative Cartography.....	3
Geog 105: Weather and Climate.....	3
Geol 1: Introductory Geology.....	3
§Geog: To be selected from the following.....	9
Geog 125: Transportation Geography	
Geog 126: World Economic Geography	
Geog 127: World Population and Settlement	
Geog 132: Natural Resources	
Geog 134: Location of Industry	
Geog 141: Urban Settlement	
Geog 145: Cultural Geography	
Geog 146: World Political Geography	
Geog 172: Historical Geography	
§Geog: To be selected from the following.....	3
Geog 151: United States and Canada	
Geog 153: Europe	
Geog 155: Africa	
Geog 161: Latin America	
Geog 165: Asia	
Geog 166: Soviet Union	
Total.....	30

* May not be chosen as a minor teaching field.

† If Chem 11-12 is elected, it must be followed by Chem 22. If Chem 15-16 is elected, Chem 22 is not required; however, Chem 50 is recommended following Chem 16.

‡ Eighteen semester hours in one science field are required for certification.

§ Not required for the minor teaching field.

German

	Semester Hours
Germ 9-10: German Conversation and Composition.....	6
Germ 51-52: Introduction to German Literature.....	6
Germ 179-80: Advanced Conversation and Composition.....	6
*German: Additional courses as approved by the adviser.....	14
Total.....	32

History†

Hist 39-40: European Civilization in Its World Context, or	
Hist 91-92: World Civilizations.....	6
Hist 71-72: Introduction to American History.....	6
Hist: Research Seminar (see adviser, Department of History)....	6
Hist: Six semester hours in each of three of the following groups as approved by the adviser.....	18
*Hist: Additional semester hours from any one of the following groups as approved by the adviser.....	6
Total.....	42

GROUP 1: AMERICAN HISTORY

Hist 167: American Colonial History	
Hist 169: The American Revolution	
Hist 170: U.S. Early National History	
Hist 171-72: U.S. Social History	
Hist 173-74: The Negro in American History	
Hist 175-76: U.S. Political History	
Hist 177: The Ante-bellum South	
Hist 179-80: U.S. Economic History	
Hist 181-82: U.S. Diplomatic History	
Hist 183: Oversea Expansion of the United States	
Hist 185: Representative Americans	

GROUP 2: EUROPEAN HISTORY

Hist 108: The Ancient Near East and Egypt to 600 A.D.	
Hist 109: Early Aegean and Greek Civilizations to 200 B.C.	
Hist 110: The Roman World to 455 A.D.	
Hist 111-12: Medieval History	
Hist 113: The Early Middle Ages	
Hist 121: The Renaissance in Western Europe	
Hist 131-32: History of Germany	
Hist 139-40: World History in the 20th Century	
Hist 141-42: History of France	
Hist 145-46: History of Russia	
Hist 147: Economic History of Europe	
Hist 149-50: European Diplomatic History	
Hist 151-52: History of England and Great Britain	
Hist 153: Tudor England	

* Not required for the minor teaching field.

† See page 289 for regulation concerning the waiver of introductory History courses.

- Hist 154: Stuart England
 Hist 157: 20th Century European Diplomatic History
 Hist 158: Modern Jewish History

GROUP 3: THE EASTERN WORLD

- Hist 138: History of World Communism
 Hist 145-46: History of Russia
 Hist 187: History of Modern China
 Hist 188: History of Chinese Communism
 Hist 193: History of the Near East
 Hist 194: History of the Modern Near East
 Hist 195-96: History of East Asia

GROUP 4: LATIN AMERICAN HISTORY

- Hist 162: History of Spain and Portugal
 Hist 163-64: History of Latin America
 Hist 165: History of Brazil
 Hist 166: History of Mexico
 P Sc 177: Governments and Politics in Latin America
 P Sc 178: Latin America: Political Patterns and International Relations

Mathematics

	Semester Hours
Math 30: Precalculus	3
Math 31: Calculus of One Variable.....	3
Math 32: Calculus of Several Variables.....	3
Math 33: Calculus of Vector Functions.....	3
Math 34: Introduction to Linear Algebra.....	3
Math 122: Introduction to Abstract Algebra.....	3
Math 124: Introduction to Matrix Theory.....	3
Math 135: Projective Geometry.....	3
*Math: Three additional courses in Mathematics approved by the adviser	9
Stat 155: Introduction to Probability.....	3
Total.....	36

Music

	Hours
Mus 5-6: Elementary Harmony.....	6
Mus 103-4: History of Music.....	6
Mus 131-32: Advanced Harmony.....	6
Applied Music: Voice or major instrument.....	6
Applied Music: Minor instruments.....	3
Ensemble: Choral or Orchestral.....	6
Music Literature: As approved by the adviser.....	3
Music Theory: As approved by the adviser.....	
Total.....	42

* Not required for the minor teaching field.

Physics

	Semester Hours
Math 30: Precalculus	3
Math 31: Calculus of One Variable.....	3
Math 32: Calculus of Several Variables.....	3
Math 33: Calculus of Vector Functions.....	3
Phys 1: General Physics	4
Phys 2: Introduction to Modern Physics.....	4
Phys 31-32: Introduction to Theoretical Physics.....	4
Phys 51-52: Introduction to Experimental Physics.....	4
Phys: To be selected from the following.....	3
Phys 161: Mechanics I	
Phys 163: Optics	
Phys 164: Thermodynamics	
Phys 165: Electromagnetic Theory	
Phys 167: Principles of Quantum Physics	
Total.....	31

Russian

Slav 9-10: Russian Conversation and Composition.....	6
Slav 91-92: Introduction to Russian Literature.....	6
Slav 125: Russian Linguistic Structure I.....	3
Slav 126: Russian Linguistic Structure II.....	3
Slav 131: 18th Century Russian Literature.....	3
Slav 141-42: 19th Century Russian Literature, or	
Slav 151-52: 20th Century Russian Literature.....	6
Slav 197: Special Problems in Teaching Russian.....	3
*Slav: Additional courses from the following as approved by the adviser	9
Slav 101-2: Readings in Modern Russian	
Slav 109-10: Advanced Russian Conversation and Composition	
Slav 128: Dostoevsky, the Man and the Artist	
Slav 143-44: The Russian Novel	
Slav 145: The Russian Short Story of the 19th Century	
Slav 146: The Russian Short Story of the 20th Century	
Slav 153: Turgenev	
Slav 154: Gogol	
Slav 156: Leo Tolstoy, His Life and Works	
Slav 161-62: Russian Culture	
Slav 165: Soviet Literature from the Revolution to World War II	
Slav 166: Soviet Literature from World War II to the Present	
Slav 193-94: Introduction to Slavic (non-Russian) Literature—in English	
Total.....	39

* Not required for the minor teaching field.

Social Studies*

	Semester Hours
Econ 1-2: Principles of Economics.....	6
Hist 39-40: European Civilization in Its World Context, or	
Hist 91-92: World Civilizations.....	6
Hist 71-72: Introduction to American History.....	6
P Sc 5-6: Introduction to Political Science.....	6
Other Courses: To be selected from the following.....	6
Anth 1-2: Introductory Anthropology	
Geog 51: Introduction to Geography	
Geog 52: World Regional Patterns	
Soc 1-2: Introductory Sociology	
†Other Courses: Second-group courses, as approved by the adviser, from Anthropology, Economics, Geography, History, Political Science, and Sociology.....	12
Total.....	42

Spanish

Span 9-10: Spanish Conversation and Composition, or	
Span 12: Spanish Conversation and Composition (Intensive).....	6
Span 51-52: Survey of Spanish Literature and Civilization.....	6
Span 91-92: Explicación de textos.....	6
Span 103: Pronunciation and Intonation.....	3
Span 109-10: Advanced Spanish Conversation and Composition.....	6
Span: Two full-year courses selected from second-group Span- ish or Spanish American Literature courses.....	12
Other Courses: Recommended from the following.....	6
Engl 115: Introduction to English Linguistics	
Foreign Lang: Other than Spanish as approved	
Hist 162: History of Spain and Portugal	
Hist 163-64: History of Latin America	
Hist 165: History of Brazil	
Hist 166: History of Mexico	
Psyc 115: Psychology of Language and Communication	
Span 193: Curso de estilo	
Span: Second-group courses in Spanish and Spanish American Literature not previously elected	
Total.....	45

Special Education‡

S Ed 102: Basic Specialized Teaching Techniques and Materials I.....	3
S Ed 103: Basic Specialized Teaching Techniques and Materials II.....	3
S Ed 170: Interpersonal/Intrapersonal Relationships for Teachers.....	3
S Ed 189: Preprofessional Internship: Special Education I.....	3
S Ed 190: Preprofessional Internship: Special Education II.....	3
S Ed 200: Understanding Young Children.....	3
S Ed 290: Practicum in Teaching in Special Education.....	6
Total.....	24

* See page 289 for regulation concerning the waiver of introductory History courses.

† Not required for the minor teaching field.

‡ Minor teaching field only. S Ed 102, 103, 170, 189, and 190 must be taken prior to the senior year.

Speech and Drama

	Semester Hours
Sp&D 1: Communicative Speaking and Listening.....	3
Sp&D 11: Voice and Diction.....	3
Sp&D 32: Oral Interpretation of Literature.....	3
Sp&D 101: Phonetics	3
Sp&D 112: Advanced Public Speaking.....	3
Sp&D 115: Acting	3
Sp&D 121: Group Discussion and Conference Leadership.....	3
Sp&D 171: Introduction to Speech Pathology and Audiology.....	3
Area of Specialization: Selected from one of the following groups as approved by the adviser	12
Total.....	36

GROUP 1: SPEECH COMMUNICATION*

Sp&D 126: Argumentation and Debate
Sp&D 127-28: Advanced Debate Practice
Sp&D 133-34: Radio and TV Broadcasting
Sp&D 143: History and Criticism of European Public Address
Sp&D 144: History and Criticism of American Public Address
Sp&D 172: Speech Pathology I
Sp&D 173: Speech Pathology II
Sp&D 176: Speech, Hearing, and Language Development
Sp&D 182: Introduction to Audiology

GROUP 2: DRAMA*

Sp&D 116: Advanced Acting
Sp&D 151: Stagecraft
Sp&D 152: Advanced Stagecraft
Sp&D 154: Play Directing
Sp&D 155-56: Play Production Practice
Sp&D 165-66: History of the Theater
Sp&D 170: Children's Theater

PROFESSIONAL EDUCATION

The basic professional information, skills, and attitudes needed by beginning teachers are provided through a sequence of courses to be taken in the junior and senior years. Lectures and class discussions are closely coordinated with field work. Instruction is differentiated to meet the needs of those preparing to teach on the various levels—elementary school, junior high school, senior high school, and adult.

Professional Courses—Secondary

	Semester Hours
Educ 108: Human Development, Learning, and Teaching.....	3
Educ 112: Educational Measurement, or	
Stat 53: Introduction to Statistics in Psychology and Education.....	3

* Not required for the minor teaching field.

	Semester Hours
Educ 123: Society and the School.....	3
Educ 131: Secondary School Principles and Methods.....	3
Educ 134: Student Teaching in Secondary Schools.....	6-9
Special Methods: Three to six semester hours from the following courses....	3-6
Educ 136: Teaching English in Secondary Schools	
Educ 137: Teaching Speech	
Educ 138: Teaching Social Studies in Secondary Schools	
Educ 139: Teaching Art in Secondary Schools	
Educ 140: Teaching Mathematics in Secondary Schools	
Educ 142: Teaching Music in Secondary Schools	
Educ 144: Teaching Science in Secondary Schools	
Educ 146: Teaching Foreign Languages	
Total.....	21-27

Professional Courses—Elementary

Educ 108: Human Development, Learning, and Teaching.....	3
Educ 111: Elementary School Curriculum and Methods.....	15
Educ 112: Educational Measurement, or	
Stat 53: Introduction to Statistics in Psychology and Education.....	3
Educ 123: Society and the School.....	3
Educ 135: Student Teaching in Elementary Schools.....	9
Total.....	33

BACHELOR OF SCIENCE IN PHYSICAL EDUCATION

The curriculum, which is designed to prepare students for teaching in elementary and secondary school programs of physical education, offers opportunities for specialization in dance, elementary school physical education, and special education.

The student wishing to prepare to teach another subject in addition to physical education may use his elective hours to work toward a minor teaching field. Relevant work in Columbian College may be counted.

PREREQUISITE

For the first two years of the Bachelor of Science in Physical Education curriculum, see Columbian College of Arts and Sciences, page 81.

CURRICULUM**Junior Year**

	Semester Hours
B Sc 163: Human Physiology.....	4
Educ 108: Human Development, Learning, and Teaching.....	3
Educ 123: Society and the School.....	3
PE 101: Physical Education in the Elementary School.....	3
PE 103: Philosophy and Principles of Physical Education.....	3

	Semester Hours
PE 105: Special Physical Education.....	3
PE 107: Teaching Ethnic Dance.....	2
PE 111: Sports Education Technique I.....	2-3
PE 112: Sports Education Technique II.....	2-3
PE 115: Intramural Program Organization.....	2-3
PE 122: Methods and Materials for Health Education.....	3
PE 158: Safety Education (men).....	3
Elective: (women)	3
Total.....	33-36

Senior Year

Educ 134: Student Teaching in Secondary Schools, or	
Educ 135: Student Teaching: Early Childhood and Elementary.....	6
PE 113: Practice in Teaching Physical Education Activities.....	3
PE 116: Intramural Program Organization (men).....	3
PE 117: Teaching Modern Dance (women), or	
PE 119: Creative Dance for Children (women).....	3
PE 131: Tests and Measurements in Physical Education.....	3
PE 138: Organization and Administration of Physical Education....	3
PE 139: Preparation and Evaluation of Student Teaching.....	3
PE 164: Physiology of Exercise.....	3
Elective:	6-9
Total.....	30-33

The Degree of Master of Arts in Education

PROGRAMS OF STUDY LEADING TO THE DEGREE of Master of Arts in Education are designed to enable prospective teachers and teachers of experience to increase their knowledge of professional and academic information and skills and prepare for special types of educational service. They also provide opportunities for college graduates in other disciplines to acquire needed professional education, as well as study in the subjects which they are planning to teach.

From the various related departments of the University, the student and his adviser select courses to give the student an adequate background in his chosen field of service. Programs for teachers-in-service and experienced teachers planning to re-enter the profession are differentiated from those for students without teaching experience.

Master's programs are available in the following fields: (1) adult education; (2) classroom teaching; (3) comparative education; (4) curriculum; (5) dance; (6) early childhood education; (7) elementary administration; (8) elementary education; (9) employee development; (10) guidance; (11) higher education; (12) history of education; (13) human growth and development; (14) philosophy of education; (15) physical education (candidates may specialize in dance, elementary school physical education, safety education, or

special education); (16) reading; (17) rehabilitation counseling; (18) secondary administration; (19) secondary education; (20) special education—diagnostic prescriptive teaching, children with behavioral problems, and early childhood special education; and (21) student personnel work in higher education.

For teachers interested in developing or strengthening their academic competence, the "classroom teaching" field normally permits 15 to 18 semester hours of work in departments other than education. These programs are designed to meet the needs of teachers-in-service who need additional work in content to qualify for advanced certification or to improve their classroom skills; and may also be helpful to previously trained teachers planning to re-enter the profession. The major emphasis is upon strengthening both the academic and professional competencies of the teacher.

Additional information concerning these programs may be obtained by writing or telephoning the Office of the Dean.

FIVE-YEAR PROGRAM

A candidate entering the School of Education from the lower division of Columbian College of Arts and Sciences (or with equivalent preparation) may choose a three-year program leading to the degrees of Bachelor of Arts in Education and Master of Arts in Education to be conferred simultaneously. The first year of this combined program will be devoted to teaching-field preparation; the work of the second year will include the degree of Bachelor of Arts in Education junior-year professional courses and a maximum of 18 semester hours of graduate courses; that of the third and final year, senior-year undergraduate professional courses and the remaining graduate courses needed for the Master's degree. Student teaching, to be elected in the third year, may not be taken for graduate credit. A quality-point index of at least 2.50 in undergraduate courses must be attained before beginning the work of the senior year, and the program must meet all the requirements for the degrees of Bachelor of Arts in Education and Master of Arts in Education.

ENTRANCE REQUIREMENTS

A Bachelor's degree from an accredited institution, an undergraduate quality-point index of 2.50 or above (*C +* average), demonstrated interest in teaching, and personality traits that give promise of better-than-average success as a teacher, are required.

Two years of successful teaching are required before admission to candidacy in the fields of guidance and school administration.

ADMISSION TO CANDIDACY

Candidates whose undergraduate preparation does not include equivalents of the basic requirements for the degree of Bachelor of Arts in Education must make up deficiencies and may be required to take designated tests.

ADVANCED STANDING

For the record, advanced standing is granted for approved courses taken at other accredited institutions, but a minimum of 30 semester hours must be completed at this University as a Master's candidate.

A maximum of 12 semester hours of advanced courses completed in this University in excess of the requirements for the Bachelor's degree may be credited toward the Master's degree if the work fits in with the student's plan of specialization and is approved in writing by the Dean before being undertaken.

Advanced standing is not granted for work completed five or more years before application for admission or readmission to Master's candidacy.

REQUIREMENTS FOR THE DEGREE

PLAN OF STUDY

The plan of study leading to the degree of Master of Arts in Education requires a minimum of 33 hours of graduate credit. The plan may, at the student's option, include a thesis carrying 6 hours of graduate credit. Whether or not a student selects the thesis option, a minimum of 18 hours, including a course in educational research methods and procedures, must be from courses planned primarily for graduate students (third-group courses). A minimum of 12 hours, not including the thesis or the research course, must be from courses offered by the School of Education.

Programs may include additional teaching-field preparation. In such cases, however, undergraduate and graduate courses combined must be at least equivalent to the undergraduate requirements for the degree of Bachelor of Arts in Education (see pages 103-16).

Programs are planned initially in conference with an admission adviser in the Office of the School of Education and subsequently with a designated adviser in the candidate's area of specialization. These programs are based on the interests of the candidate, his previous background, and the certification requirements of the state and locality in which the candidate plans to teach.

All degree requirements must be completed within a period of six years.

RESIDENCE

A candidate for the Master's degree is required to complete satisfactorily 30 semester hours in residence in the School. With the approval of the adviser, 9 of the 30 hours may be off-campus courses in the College of General Studies.

SCHOLARSHIP

For graduate work grades are indicated as *A*, excellent; *B*, good; *C*, minimum pass; *F*, fail; *I*, incomplete; *W*, authorized withdrawal; *CR*, credit. Grades *A*, *B*, *C*, and *F* are counted in computing the quality-point index (see page 45).

A quality-point index of 3.00 is required for graduation. Students who receive the grade of *C* in more than two courses are subject to suspension. Students who receive a grade of *F* must confer with the Dean of the School of Education before enrollment for further work.

Whenever a grade has not been assigned, the symbol *I* (incomplete) or the symbol *W* (authorized withdrawal) will be recorded. The symbol *I* indicates that a satisfactory explanation has been given to the instructor for the student's failure to complete the required work of the course. An "incomplete" cannot be made up after the lapse of one calendar year except by written permission of

the Dean's Council. An incomplete which is not removed within one calendar year is automatically changed to an *F*. An incomplete cannot be removed by reregistering for the course.

THE THESIS

The choice of the thesis subject must be approved in writing by the student's adviser and filed in the Office of the Dean. A statement of the School of Education standards for the thesis and printed copies of detailed regulations regarding the form and reproduction of the thesis are available in the Office of the Dean.

Payment of tuition for the thesis entitles the candidate, during the period of registration, to the advice and direction of the member of the faculty under whom the thesis is to be written. In case a thesis is unfinished, an additional calendar year may be granted without further tuition payment. The student must, however, maintain continuous registration (see page 47) during this period. If the preparation of the thesis extends beyond the additional calendar year, the student must register for the entire 6 hours of thesis again and pay tuition as for a repeated course.

MASTER'S COMPREHENSIVE EXAMINATION

In addition to the course examinations, the candidate must pass a special three-hour examination on his area of specialization. Candidates for the examination must be registered for the semester it is to be taken, and must file a written application in the Office of the School of Education no later than thirty days prior to the date of the examination.

The Degree of Education Specialist

THE SCHOOL OF EDUCATION PROVIDES A PROGRAM of advanced study leading to the degree of Education Specialist for students with Master's degrees in Education who seek further professional preparation for specific objectives.

ENTRANCE REQUIREMENTS

The degree of Master of Arts in Education from this University (or the equivalent), a satisfactory score on the Miller Analogies Test or the Graduate Record Examination, and two years of successful pertinent experience, are required.

ADMISSION TO CANDIDACY

Each applicant must be interviewed and recommended by a staff member of the School of Education or by a representative in the candidate's locality appointed by the Dean.

SCHOLARSHIP

Scholarship requirements for the degree of Education Specialist are the same as those for the degree of Master of Arts in Education (see pages 119-20).

PROGRAMS OF STUDY AND DEGREE REQUIREMENTS

Individual programs are developed, through the faculty-adviser plan, to fit the candidates' abilities, interests, needs, and career goals. Thirty semester hours beyond the requirements of the degree of Master of Arts in Education at this University are required. At least 21 hours of this work must be taken on campus at this University. A maximum of five calendar years is allowed for completion of the program.

At least 12 of the required 30 hours must be in appropriate graduate courses in Education selected from the following areas: (1) foundations and cognate study, (2) background and general principles of the field of study, (3) an area of specialization.

THE COMPREHENSIVE EXAMINATION

Successful completion of two three-hour written examinations is required.

THE ORAL EXAMINATION

The final oral examination must be passed at least three weeks before the degree is to be conferred. The examination committee consists of members of the staff of the School of Education and at least one successful practitioner in the appropriate area of specialization, appointed by the Dean of the School of Education.

The Degree of Doctor of Education

THE SCHOOL OF EDUCATION OFFERS PROGRAMS of advanced study leading to the degree of Doctor of Education. These programs, which are under the supervision of the Committee on Graduate Studies, provide major fields of study in administration and supervision, adult education, curriculum, elementary administration, elementary education, employee development, guidance and counseling, higher education, history of education, philosophy of education, secondary administration, secondary education, special education, and teacher education. Supporting fields are available in administrative specialties, human growth and development, rehabilitation counseling, and student personnel work in higher education. With the approval of the Committee on Graduate Studies and of the departments concerned, one or two supporting fields may be taken in other departments of the University. All programs require study of interrelated areas of education and a doctoral dissertation in the major field of study.

ADMISSION

The applicant must have adequate preparation for advanced study, including graduate work in fields prerequisite to his objective equivalent to that required for the degree of Master of Arts in Education at this University, at least three years of successful pertinent educational experience, acceptable personal qualities, and a capacity for creative scholarship and effective leadership.

The applicant first arranges for an interview with the Assistant Dean for advanced graduate studies to explore his needs in relation to the resources of the School and to guide him in his application for doctoral study.

To be admitted to study for the degree, the applicant must be accepted by the Committee on Graduate Studies on the basis of previous scholastic and professional record; prescribed admission tests, including the Aptitude Test of the Graduate Record Examination or the Miller Analogies Test; personal conferences with at least three faculty members, including the professor under whom the applicant wishes to work; and a group interview with the Committee on Graduate Studies. When the applicant meets with the Committee on Graduate Studies, he should be prepared to present an outline of his plan of study, including the selection of major and supporting fields.

PLAN OF STUDY

In general, from two to three years of full-time study beyond the degree of Master of Arts in Education, or the equivalent in part-time study, is required. Programs are individually planned. It is estimated that, for the average student, the work required for the total program will be 66 semester hours, including a minimum of 12 semester hours of dissertation research.

Each program is divided into two parts. The first consists of preparation for comprehensive examinations in a major field of study and each of four supporting fields, and a tool-subject requirement. The second is composed of research investigation, the writing of a dissertation, and the final oral examination.

Students who have completed the comprehensive examinations and who were not registered for doctoral study under the payment plan in effect prior to July 1, 1967, must register for a minimum of 6 semester hours of Dissertation Research (491) a semester until 12 hours have been completed, and a minimum of 3 semester hours a semester thereafter until the satisfactory completion of the final examination.

COMPREHENSIVE EXAMINATIONS

When the student is admitted to doctoral candidacy, he is assigned to a committee, each member of which is responsible for guiding him in his preparation for one of the four required comprehensive examinations in supporting fields or the comprehensive major field examination. The candidate must arrange individual conferences with the committee members to determine the content of each field and to receive guidance in his preparation for the examination. All candidates are required to complete Educ 296 during the first or second semester of candidacy.

The supporting field examinations, which are taken first, are six-hour written examinations. A tool-subject requirement may be established by the candidate's Dissertation Committee if it is necessary for the successful completion of his dissertation. This requirement must be completed prior to the major field examination. The major field examination is a written twelve-hour examination, six hours on each of two successive days.

The candidate begins the second part of his program after the satisfactory completion of all supporting field examinations; the tool subject, if required; and the major field examination.

THE DISSERTATION

A dissertation is required as evidence of ability to perform scholarly research and to interpret and present its results.

During the first part of the program, the Dean appoints a Dissertation Committee, consisting of a Major adviser as Director, usually the major field adviser, and two additional faculty members who serve as readers. The candidate is required to submit a proposal for his dissertation to this Committee, which determines its acceptability and recommends approval to the Committee on Graduate Studies. The dissertation is completed under the direction of the Dissertation Committee.

No later than the date specified in the calendar, the candidate must submit to the Dean three complete copies of the dissertation and two copies of an abstract for inclusion in the announcement of the examination and for reproduction by University Microfilms, Inc. Printed copies of detailed regulations regarding the form and reproduction of the dissertation, preparation of the abstract, and services offered by University Microfilms, Inc., are available in the Office of the Dean. The successful candidate for the doctorate is required, before receiving his degree, to pay a fee to cover the expense of printing the abstract of dissertation, and for the basic service rendered by University Microfilms, Inc.

THE FINAL EXAMINATION

When the dissertation has been accepted, the Director recommends the candidate to the Dean for the final oral examination, which must be passed at least three weeks before the degree is to be conferred. The examination is open to the public and is conducted by a committee of the Faculty, appointed by the Dean, supplemented by at least two leaders in the candidate's field of study from outside the University. Candidates who successfully pass the oral examination are recommended for the degree by the Faculty of the School of Education.

RESIDENCE AND CONTINUOUS STUDY

All the preparation for the degree, including examinations and work other than courses and seminars, which is done under the direction of an adviser, must be done in residence. The student must remain registered in the School of Education, except when the Dean or the Committee on Graduate Studies has granted a leave of absence. Failure to register each semester of the academic year may result in lapse of candidacy. Subsequent readmission is subject to whatever new conditions and regulations have been established by the Committee on Graduate Studies.

There is no formal regulation concerning the minimum amount of time to be spent in preparation for the minor and supporting field examinations or as a candidate engaged in doctoral research. The supporting and major field examinations, however, must be completed within five years of the date of admission, and the entire program must be completed within eight years, regardless of full-time or part-time study. Each candidate is required to complete one semester or more of his program in full-time study. Full-time study of six weeks or more in each of two Summer Sessions is equivalent to full-time study for one semester.

Special Programs and Services

MASTER OF ARTS IN TEACHING PROGRAM IN ELEMENTARY EDUCATION

THE SCHOOL OF EDUCATION OFFERS AN INTENSIVE fifth-year program, partially supported by paid teaching internships, designed to prepare selected graduates of accredited liberal arts colleges for teaching in elementary schools. Successful fulfillment of the program's requirements provides the professional courses necessary for certification as an elementary teacher. Students may receive the degree of Master of Arts in Teaching on completion of the program or receive credit for 15 semester hours of graduate work toward the degree of Master of Arts in Education.

For details, write to the Chairman of the Department of Education, M.A.T. Program in Elementary Education, George Washington University, Washington, D.C. 20006.

ADMISSION TO THE PROGRAM

To be admitted as a student-intern, an applicant must (1) have a Bachelor's degree from an accredited liberal arts institution, including courses related to the general education requirements for teacher certification; (2) show evidence of interest in children and a sincere desire to teach; (3) submit three written references attesting to quality of academic record and personality; (4) submit a score on the Aptitude Test of the Graduate Record Examination or the Miller Analogies Test; and (5) be interviewed by the University Selection Committee, or under arrangements specified by the Committee and approved by the Dean of the School of Education.

PLAN OF STUDY

Beginning with a six-week summer session the program includes a September experience and full-time study in the fall semester. Course work during this time is planned to help each student gain understanding of (1) the characteristics of elementary school children, (2) the subject-matter areas of the elementary school curriculum, (3) basic dimensions of teaching methodology, (4) the relationship between educational theory and methods, (5) educational tests and measurements, and (6) the role of the school in American society.

During the fall semester, students will be given full-time student teaching assignments in a nearby public school. This part of the program will permit the student to use, in an actual teaching situation, the educational theories and methods which he has been studying.

A salaried internship during the spring semester in one of the cooperating school systems in the area gives the student an opportunity to assume the responsibilities of a beginning teacher, with the help and guidance of University and public school staff members. Seminar meetings will be scheduled weekly for discussion of common problems and for cooperatively planned work on individual and group needs of interns. Each student plans, conducts, and reports on an Action Research Project.

EDUCATION OF TEACHERS OF EXCEPTIONAL CHILDREN

The School of Education offers a program for the education of teachers of exceptional children. Laboratory experiences are arranged in schools for handicapped children in the metropolitan area. Students are accepted at the junior- or senior-year undergraduate, Master's, Education Specialist, and Doctoral levels. By special permission, teachers, school administrators, and adequately prepared students from other schools and colleges of the University may elect these courses.

Inquiries concerning the program and the availability of scholarships and fellowships should be directed to Dr. Perry Botwin, Department of Special Education, George Washington University, Washington, D.C. 20006.

GRADUATE PROGRAM IN REHABILITATION COUNSELING

The School of Education offers a Federally funded, Master's degree program, for the preparation of rehabilitation counselors. These professional personnel assist persons who are disabled or disadvantaged to assume a proper place in society. The two-year program combines fieldwork with course work in preparing students for immediate employment in an expanding field that yields high humanitarian and financial rewards. Both the profession and the program are interdisciplinary, drawing upon such related areas as guidance, medicine, psychology, social work, sociology, and special education.

Traineeships, including tuition and stipends are available for full-time students. Information and applications are available from Dr. Daniel Sinick, Rehabilitation Counselor Education, George Washington University, Washington, D.C. 20006.

CERTIFICATION CURRICULA

The School of Education provides individually planned programs for liberal arts graduates and for housewives and retired military personnel with appropriate degrees who wish to prepare for teaching. Those seeking certification, but not wishing to work for a degree, may enroll in a certification program if they meet the admission, scholarship, and personality requirements of degree candidates. The School also provides a wide range of courses of interest to teachers who wish to renew licenses.

READING CENTER (see page 53)



SCHOOL OF GOVERNMENT AND BUSINESS ADMINISTRATION

Dean J.C. Dockeray

FACULTY

Professors Frederick Amling, H.F. Bright, D.S. Brown, D.R. Cloutier, J.C. Dockeray, R.B. Eastin, R.F. Ericson, F.H. Gibbs, Leon Gintzig, W.A. Hamrick, Roy Herrmann (*Visiting*), J.L. Jessup, E.J.B. Lewis, G.L. Lippitt, H.R. Page, D.D. Roman, S.M. Rosen (*Visiting*), Waldo Sommers, K. E. Stromsem, Edwin Timbers

Associate Professors G.R. Allen, R.A. Barrett, Lloyd Bartholomew, Guy Black, D.P. Boyd, S.F. Divita, Rodney Eldridge, M.G. Gallagher, P.D. Grub, R.F. Hartley, R.L. Holland, C.D. Hughes, F.C. Kurtz, G.P. Lauter, E.R. Magruder, L.H. Mantell, A.J. Mastro, J.F. McCarthy, Jr., D.C. McGrath, Jr., E.J. Mock, Chei-Min Paik, R.C. Sedwick, T.E. Shaughnessy, J.N. Stonesifer, E.K. Winslow, M.M. Wofsey

Adjunct Associate Professor H.C. Demoody

Assistant Professors Elizabeth Adams, S.R. Chitwood, G.F. Conner, S.S. Fuller, Sherwin Greene, P.N. Reeves, T.F. Riley, J.R. Roman, Jr., S.N. Sherman, L.C. Smith, W.E. Smith, J.L. Thompson, Jr., J.W. Waldrip

Adjunct Assistant Professor Norma Loeser

Instructor L.W. Katz

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J.C. Dockeray (*Chairman*), S.R. Chitwood, Leon Gintzig, P.D. Grub, R.L. Holland, E.J.B. Lewis, H.R. Page, L.C. Smith

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R.A. Barrett (*Chairman*), D.R. Cloutier, Leon Gintzig, F.C. Kurtz, E.R. Magruder, J.F. McCarthy, Jr.

COMMITTEE ON DOCTORAL STUDIES IN BUSINESS ADMINISTRATION AND PUBLIC ADMINISTRATION

D.D. Roman (*Chairman*), D.R. Cloutier, S.S. Fuller, Leon Gintzig, P.D. Grub, R.L. Holland, Chei-Min Paik

* The Dean of the School is an ex officio member of all committees.

COUNCIL*

The School of Government and Business Administration Council operates as an advisory group on policy, finance, and community relations. It consists of responsible members of the business and government communities, and of the faculty, administrators, and students of the School.

CHAIRMAN

August Schomburg, *Lieutenant General, USA (Ret.)*

MEMBERS OF THE COUNCIL

- Everett H. Bellows (*University Trustee*), *Vice President of the Washington Office, Olin Corporation*
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 David James Sharpe, *Professor of Law*
 Douglas R. Smith, *President, National Savings & Trust Company, Washington, D.C.*
 Joseph H. Taggart, *Dean, Graduate School of Business Administration, New York University*
 Robert P. Thome, *Comptroller, The Washington Post Company, Washington, D.C.*
 James Otis Wright (*University Trustee*), *Corporate Director, Sea Island, Ga.*

STUDENT MEMBERS OF THE COUNCIL

Clifton Brown
 Stanley K. Moseley

* The President of the University, the Chairman of the Board of Trustees, the Vice President for Academic Affairs, the Vice President for Development, and the Dean of the School of Government and Business Administration are ex officio members of the Council.

INTRODUCTION

The study of Government was first organized as a separate entity in the University in 1898 with the establishment of the School of Comparative Jurisprudence and Diplomacy. In 1928, this School was reorganized and broadened as the School of Government. During the next two decades, programs in business administration and public administration were added, and the emphasis gradually shifted from undergraduate to graduate study. The name was changed in 1960 to the School of Government, Business, and International Affairs to reflect more accurately the offerings of the School. A division of the School was effected in 1966, and two schools were established—the School of Government and Business Administration, a primarily professionally-oriented school; and the School of Public and International Affairs, a primarily policy-oriented school.

Programs of the School of Government and Business Administration include examination of administrative principles and the quantitative approaches to decision making common to both business and government. These programs stress the points at which major policy decisions of either business or government must give consideration to related policy decisions of the other. Emphasis is placed upon the fact that management education is not limited to organizational techniques but is, in its broadest sense, education for management responsibility.

Students in the freshman and sophomore years are registered in the lower division of Columbian College of Arts and Sciences, the liberal arts college of the University. Here they are assigned special advisers from this School to assist them in planning their programs.

ACADEMIC PROGRAMS

Programs in the fields of Accounting, Business Administration, Business and Economic Statistics, Health Care Administration, International Business, Personnel Administration, Public Administration, and Urban and Regional Planning are all available within the School of Government and Business Administration.

ACADEMIC STATUS

The School of Government and Business Administration has maintained full membership in the Middle Atlantic Association of Colleges of Business Administration since 1961. It joined the Council on Graduate Education for Public Administration in 1966. By invitation, in 1968, the School became a charter academic member of the American Association of Collegiate Schools of Business Assembly. The programs in Public Accounting designed to prepare students for Certified Public Accountants examinations have been approved by the state boards of New York and Maryland. The program in Hospital Administration has been accredited by the Association of University Programs in Hospital Administration since 1962.

REGULATIONS

Regulations concerning ADMISSION, REGISTRATION, FEES AND FINANCES are stated on pages 23-33; other University regulations, on pages 43-51.

ATTENDANCE

A student may not attend classes until registration is completed and fees due are paid. A student may be dropped from any course for undue absence.

The student is held responsible for all the work of the courses in which he is registered, and all absences must be excused by the instructor in charge before provision is made for him to make up the work missed.

A student suspended for any cause may not attend classes during the period of suspension.

INDEPENDENT STUDY PLAN

A student of *demonstrated capacity*, with a special interest in the subject matter of a course, may be permitted to undertake study under the personal direction of an instructor, in accordance with the rules of the appropriate department. Credit under this plan is limited to the specific course credits normally allowed when taken on a class basis.

Bachelor of Business Administration

THE SCHOOL OFFERS PROGRAMS leading to the degree of Bachelor of Business Administration in the fields of Accounting, Business Administration, Business and Economic Statistics, and International Business.

ENTRANCE REQUIREMENTS

The satisfactory completion of the *Accounting, Business Administration, and International Business* or the *Business and Economic Statistics* curriculum in the lower division of Columbian College of Arts and Sciences (see pages 81-82), or the equivalent, is required. Students transferring from other colleges and universities as juniors must offer an acceptable broad-based liberal arts program, or the equivalent.

REQUIREMENTS FOR THE DEGREE

ACADEMIC WORK LOAD

A full-time student not on probation may not ordinarily take more than 15 semester hours. A student employed more than 24 hours a week, who is not on probation, may not take more than 9 semester hours.

A full-time student whose quality-point index is 3.50 or higher may take not more than 18 semester hours. A student employed more than 24 hours a week, whose index is 3.50 or higher, may take up to 12 semester hours.

A student who accepts employment after registration or at any time during a semester must report immediately to the Dean, so that his program may be adjusted if necessary.

Exception to these rules will require the approval of the Dean.

SCHOLARSHIP

In order to graduate, a student must have the following: (1) a general quality-point index of at least 2.00 and (2) an index in his major of at least 2.50. The major includes the required courses and courses taken in the group options.

DEAN'S HONOR LIST

The names of students who achieve a quality-point index of 3.50 or higher are placed on the Dean's Honor List for that semester. Appearance on the list will be limited to (1) full-time students registered for a minimum of 12 semester hours and (2) part-time students registered for a minimum of 12 semester hours over a period of two consecutive semesters, which may include a summer term.

PROBATION

A student whose quality-point index falls below 2.00 after completing a minimum of 12 semester hours of study will be placed on probation. This probation extends over the period in which the student attempts 12 semester hours of work which may include remedial studies as prescribed.

SUSPENSION

A student whose quality-point index is 1.50 or below or whose index remains below 2.00 at the end of his probationary period may be suspended. A student suspended for poor scholarship may apply for readmission after the lapse of either the fall or spring semester. To be considered for readmission, he must pass prescribed tests and submit evidence to the Dean's Council that during his absence from the University he has so conducted himself as to indicate that he will profit by readmission. A student readmitted after suspension is on probation and must maintain a current quality-point index of at least 2.50 on each 12 semester hours of work undertaken until his cumulative index is 2.00. In no case will the probationary period after readmission exceed 24 hours of study. A student suspended twice for poor scholarship will not be readmitted.

RESIDENCE

A minimum of 30 semester hours, including at least 12 hours in the major field, must be completed while registered in the School of Government and Business Administration. This requirement applies to students transferring within the University as well as to students transferring from other institutions. Summer work may be counted toward the residence requirement, but in no case may the period of residence aggregate less than thirty weeks. Unless special permission is granted by the Dean to pursue work elsewhere, the work of the senior or final year must be completed in the School of Government and Business Administration.

USE OF CORRECT ENGLISH

Any student whose written or spoken English in any course is unsatisfactory may be reported by the instructor to the Dean. The Dean may assign supplementary work, without academic credit, varying in amount with the needs of

the student. If the work prescribed is equivalent to a course, the regular tuition fee is charged. The granting of a degree may be delayed for failure to make up such deficiency in English to the satisfaction of the Dean.

CREDIT/NO CREDIT OPTION (see page 45)

CORRESPONDENCE AND HOME-STUDY COURSES

Credit for correspondence or home-study courses is not acceptable and cannot be applied toward a degree.

CURRICULUM REQUIREMENTS

To be recommended by the Faculty for graduation, candidates are required to complete, in addition to the appropriate freshman and sophomore work, a minimum of 60 semester hours during the junior and senior years, as set forth in one of the following curricula.

EXAMINATIONS FOR WAIVING CURRICULUM REQUIREMENTS

A required course may be waived by the satisfactory passing of a waiver examination authorized and prescribed by the department or curriculum adviser concerned. Passing this examination does not entitle the student to any hours of credit toward the degree. Request to take the examination should be made to the curriculum adviser and the required fee paid at the Office of the Cashier before the date set for the examination.

MAJOR FIELDS FOR THE BACHELOR'S DEGREE

Candidates for the degree of Bachelor of Business Administration must have completed the requirements of the Columbian College of Arts and Sciences Lower Division in the relevant curriculum: Accounting, Business Administration, and International Business, page 81; Business and Economic Statistics, pages 81-82; or the equivalent.

ACCOUNTING

For the first two years of the Accounting curriculum, see page 81.

Programs are offered in three areas of professional specialization: (1) Managerial Accounting in Business; (2) Federal Financial Management—Accounting and Budgeting; and (3) Public Accounting.

Required—Junior and Senior Years

	Semester Hours
Acct 101: Cost Accounting	3
Acct 121-22: Intermediate Accounting	6
Acct 161: Federal Income Taxation	3
Acct 171: Auditing	3
B Ad 102: Fundamentals of Management	3
B Ad 131: Business Finance	3
B Ad 161: Commercial Law: Contracts, Sales, Agency, Bailments....	3

	Semester Hours
B Ad 162: Commercial Law: Negotiable Instruments, Property, Mortgages	3
Econ 121: Money and Banking.....	3
Area of Professional Specialization:.....	15
Elective: To be selected in consultation with the adviser at the beginning of the junior year.....	15
Total	60

All Accounting majors must complete the *required* courses listed above, plus one of the following 15 semester-hour areas of professional specialization. Special programs and elective courses may be arranged in consultation with the Department of Accounting.

GROUP I: MANAGERIAL ACCOUNTING IN BUSINESS

Students preparing for careers in managerial accounting in business may specialize in a particular area of accounting, such as systems, budgeting, or income tax, or may concentrate on broadening their backgrounds in business administration or in more general fields of knowledge. The Managerial Accounting program thus provides maximum flexibility for students who wish to combine basic training in accounting with other career interests, in preparation either for general business responsibilities or in preparation for more specific careers in the financial management field.

Courses relating to Managerial Accounting to be selected with the approval of the adviser (may not include Accounting courses in excess of 9 hours).

GROUP II: FEDERAL FINANCIAL MANAGEMENT—ACCOUNTING AND BUDGETING

Students preparing for careers in financial management in the Federal Government may combine basic professional training in accounting with more specialized training in the financial management techniques used in administering the complex affairs of modern-day government. A flexible program can be developed in keeping with the specific career objectives of the individual student by the careful selection of electives.

Courses relating to Federal Financial Management to be selected with approval of the adviser (may not include Accounting courses in excess of 9 hours).

GROUP III: PUBLIC ACCOUNTING

The Public Accounting program is a concentrated professional curriculum designed to prepare students for careers in public accounting. It combines the maximum number of professional accounting courses consistent with the broad educational background essential to successful accounting careers in the modern business world.

Courses relating to Public Accounting to be selected with approval of the adviser.

BUSINESS ADMINISTRATION

For the first two years of the Business Administration curriculum, see page 81.

The program in Business Administration is designed to provide the broad foundation required for eventual top leadership in either governmental or business administration. It consists of the 30 semester hours of *required* courses; 15 hours in one of the following group options; and 15 hours of electives, normally advanced courses in liberal arts subjects.

Required—Junior and Senior Years

	Semester Hours
Acct 193: Business Budgeting	3
B Ad 102: Fundamentals of Management.....	3
B Ad 105: Personnel Management	3
B Ad 131: Business Finance	3
B Ad 141: Basic Marketing Management	3
B Ad 161: Commercial Law: Contracts, Sales, Agency, Bailments....	3
B Ad 162: Commercial Law: Negotiable Instruments, Property, Mortgages	3
B Ad 191: Business Reports and Analyses.....	3
B Ad 198: Case Problems in Management.....	3
Econ 121: Money and Banking.....	3
Group Option: To be selected from one of the following groups.....	15
Elective: To be selected in consultation with the adviser.....	15
Total.....	60

GROUP OPTIONS

Seven areas of specialization are open to Business Administration majors. The 15 hours taken in each of these options require the approval of the adviser. The group option and the individual courses within the option should be selected *no later than the beginning of the second semester of the junior year.*

GROUP I: AUTOMATIC DATA PROCESSING

The following courses provide the basic academic foundation for positions in data processing in government, business, and industry. They also give the student an understanding of the manager's use of data processing as a vital managerial technique.

- B Ad 118: Introduction to Data Processing
- B Ad 119: Data Processing Programming
- B Ad 120: Data Processing Systems
- Stat 111, 112: Business and Economic Statistics I, II

GROUP II: ECONOMICS

The following courses provide the basic academic foundation for such positions as financial economic analyst, industrial economic analyst, and market research analyst in business and government.

- B Ad 132: International Business Finance
- B Ad 133: Capital Formation
- B Ad 176: International Business Theory and Policy
- *Econ 101: Intermediate Microeconomic Theory
- *Econ 102: Intermediate Macroeconomic Theory
- Econ 158: Industrial Organization
- Econ 161, 162: Public Finance I, II
- Econ 181-82: International Economics
- Stat 111, 112: Business and Economic Statistics I, II

* Required for this group option.

GROUP III: FINANCE

The following courses provide the basic academic foundation for such positions as credit analyst, supervisor in a financial institution, bond cashier, trust officer, bank examiner, and similar positions in federal or international financial institutions.

- *Acct 111: Financial Statement Analysis
- Acct 121-22: Intermediate Accounting
- B Ad 113: Real Estate
- B Ad 118: Introduction to Data Processing
- B Ad 121: Fundamentals of Insurance
- B Ad 122: Insurance Estate Planning
- B Ad 132: International Business Finance
- B Ad 133: Capital Formation
- B Ad 135: Managerial Finance
- *B Ad 138: Investment and Portfolio Management
- B Ad 163: Law in Relation to the Form of Business Units:
Corporations, Partnerships, and Trusts
- Econ 101: Intermediate Microeconomic Theory

GROUP IV: MARKETING

The following courses provide the basic academic foundation for such positions as sales manager, marketing manager, product development manager, research director, buyer, advertising director, sales promotion manager, and credit manager.

- B Ad 142: Retail Marketing
- *B Ad 143: Marketing Research
- B Ad 144: International Marketing Management
- *B Ad 145: Sales Management
- B Ad 147: Advertising
- B Ad 158: Physical Distribution Management
- B Ad 171: Principles of Transportation
- B Ad 175: Introduction to Foreign Trade
- B Ad 177: Foreign Markets
- B Ad 178: Management of International Business Operations
- B Ad 181: Manufacturing Production

GROUP V: PERSONNEL MANAGEMENT

The following courses provide the basic academic foundation for such positions as personnel manager, employee relations manager, and employment manager in business and government service.

- *B Ad 106: Problems in Personnel Management
- *B Ad 107: Collective Bargaining
- B Ad 118: Introduction to Data Processing
- Jour 145: Principles and Problems of Public Relations
- Psyc 129: Theories of Personality
- Psyc 131: Psychological Tests
- Psyc 144: Personnel and Industrial Psychology
- Sp&D 121: Group Discussion and Conference Leadership

* Required for this group option.

GROUP VI: STATISTICS

The following courses provide the basic academic foundation for such positions as financial statistician, planning statistician, industrial statistician, and rate analyst in business and government.

- B Ad 118: Introduction to Data Processing
- Stat 91: Principles of Statistical Methods
- Stat 110: Quality Control and Reliability Techniques
- *Stat 111, 112: Business and Economic Statistics I, II
- Stat 117: Analysis of Variance
- Stat 118: Regression Analysis
- Stat 155: Introduction to Probability
- Stat 157-158: Introduction to Mathematical Statistics

GROUP VII: TRANSPORTATION AND TRAFFIC MANAGEMENT

The following courses provide the basic academic foundation for management positions in transportation firms and in traffic departments of other types of business firms and government agencies. The program should also aid in the preparation for the examinations for membership in the American Society of Traffic and Transportation.

- B Ad 158: Physical Distribution Management
- *B Ad 171: Principles of Transportation
- B Ad 172: Public Utilities
- *B Ad 173: Transportation Systems Management
- B Ad 174: Urban Transportation
- *B Ad 175: Introduction to Foreign Trade
- CE 183: Urban Planning
- Geog 125: Transportation Geography

BUSINESS AND ECONOMIC STATISTICS

For the first two years of the Business and Economic Statistics Curriculum, see pages 81-82.

The undergraduate program in Business and Economic Statistics is designed as preparation for business and economic analysis. It consists of 30 semester hours of *required* courses and 30 hours of electives from Accounting, Business Administration, Economics, and Statistics.

Required—Junior and Senior Years

	Semester Hours
B Ad 102: Fundamentals of Management.....	3
B Ad 131: Business Finance, or	
B Ad 141: Basic Marketing Management.....	3
B Ad 161: Commercial Law: Contracts, Sales, Agency, Bailments....	3
B Ad 162: Commercial Law: Negotiable Instruments, Property, Mort- gages	3
B Ad 191: Business Reports and Analyses.....	3
Econ 101: Intermediate Microeconomic Theory.....	3
Econ 102: Intermediate Macroeconomic Theory.....	3
Stat 111, 112: Business and Economic Statistics I, II.....	6

* Required for this group option.

	Semester Hours
Elective (A): To be selected from Statistics.....	18
Elective (B): To be selected in consultation with the adviser.....	15
Total.....	60

INTERNATIONAL BUSINESS

For the first two years of the International Business curriculum, see page 81.

This program is designed to provide the basic academic foundation for positions in international business, both in private industry and in government. It consists of 30 semester hours of *required* course work and 30 hours of electives. Any modification of the program must be made with the consent of the adviser.

Required—Junior and Senior Years

	Semester Hours
B Ad 102: Fundamentals of Management.....	3
B Ad 131: Business Finance	3
B Ad 132: International Business Finance.....	3
B Ad 141: Basic Marketing Management.....	3
B Ad 144: International Marketing Management.....	3
B Ad 161: Commercial Law: Contracts, Sales, Agency, Bailments....	3
B Ad 175: Introduction to Foreign Trade.....	3
B Ad 176: International Business Theory and Policy.....	3
B Ad 178: Management of International Business Operations.....	3
Econ 121: Money and Banking.....	3
Elective: The 30 hours of elective courses should be selected, in consultation with the adviser, from Accounting, Business Administration, Economics, Geography and Regional Science, Political Science, Sociology, Statistics, or any modern foreign language; however, up to 9 semester hours of courses in other approved areas may be substituted with the permission of the adviser.....	30
Total.....	60

The Master's Degrees

Master of Business Administration

PROGRAMS LEADING TO THE DEGREE of Master of Business Administration are offered in the following fields:

Accounting	International Business
Business Administration	Personnel Administration
Health Care Administration	

Master of Public Administration

Programs leading to the degree of Master of Public Administration are offered in the following fields:

Health Care Administration
Personnel Administration

Public Administration
Urban and Regional Planning

Master of Urban and Regional Planning

This program leads to the professional planning degree of Master of Urban and Regional Planning.

Master of Arts in Government

Programs leading to the degree of Master of Arts in Government are offered in the following fields:

Business and Economic Statistics
Personnel Administration

Public Administration
Urban and Regional Planning

Master of Arts in Health Care Administration

Programs leading to the degree of Master of Arts in Health Care Administration are offered in various aspects of Health Care Administration.

ENTRANCE REQUIREMENTS

A Bachelor's degree from an accredited college or university, with a quality-point index of 3.00 (a *B* average) in the relevant undergraduate field, is required.

Students who lack sufficient undergraduate study in business or related fields may be required to make up these deficiencies by taking specified undergraduate courses and maintaining a 3.00 average in those courses.

Applicants for admission to programs leading to the degree of Master of Business Administration must submit acceptable scores on the Admission Test for Graduate Study in Business; applicants for admission to programs leading to the degrees of Master of Arts in Government, Master of Arts in Health Care Administration, Master of Business Administration, Master of Public Administration, and Master of Urban and Regional Planning must submit scores on the Admission Test for Graduate Study in Business or the Graduate Record Examination. It is the responsibility of the applicant to make arrangements for the required test with the Educational Testing Service, Princeton, N.J. 08540. Correspondence concerning the Admission Test for Graduate Study in Business should be addressed to Box 966; concerning the Graduate Record Examination, to Box 955.

GENERAL REQUIREMENTS

A program of greater length, including undergraduate background courses, may be assigned for an applicant whose undergraduate degree was in a field other than the graduate program he wishes to follow, or whose undergraduate record indicates a weakness in required background courses.

Master's degrees are awarded by vote of the Faculty on completion of the required course work, an acceptable thesis or the equivalent, and the passing of the Master's Comprehensive Examination. An applicant whose background does not include the necessary courses must take a program longer than the minimum hours required.

Second-group courses (numbered 101-200) may be counted toward the Master's degree only when registration for graduate credit has been approved at the time of registration by the Dean and the curriculum adviser. No work counted toward a Bachelor's degree may also be counted toward a Master's degree.

Full-time students are normally expected to register for 9 to 12 semester hours each semester. All work for a Master's degree must be completed in five years, unless an extension of time is granted by the Dean.

A student who expects to continue his studies for the degree of Doctor of Business Administration or Doctor of Public Administration after receiving the Master's degree should ask for assistance in planning his program so that he may qualify for admission to candidacy for the Doctorate.

No credit is granted for work done *in absentia* or without formal instruction, except for hospital residency, supervised field experience, and the thesis, which may be completed *in absentia* with the permission of the department, curriculum adviser, or committee concerned.

MASTER'S COMPREHENSIVE EXAMINATION

In addition to individual course examinations the candidate must pass a general written Master's Comprehensive Examination. In writing the examination the student is expected to correlate what he has learned in his course work and his reading in the literature of his fields. The examination normally requires from seven to nine hours writing time. Sections broadly cover the various fields in which the candidate has prepared himself.

The examinations are scheduled two times a year, in December and April, and should be taken during the last semester of course registration or shortly after completion of the prescribed course work. If there is a lapse of time between completion of course work and the taking of the examination, the student must maintain continuous registration and must be registered for the semester in which the examination is taken.

The candidate should consult with his adviser, well in advance, as to the dates of his examination and the definition of the subject-matter fields which his examination is to cover. A written application is filed, in the form prescribed, with the Office of the Dean no later than thirty days prior to the examination.

A candidate who fails the examination may, in exceptional circumstances and with specific approval of his advisers, repeat the examination, but only after the lapse of one semester and the undertaking of additional preparation as prescribed. If he fails a second time, no further opportunity to take the examination will be permitted.

SCHOLARSHIP

Grades for graduate work are *A*, excellent; *B*, good; *C*, minimum pass; *F*, fail; *I*, incomplete; *W*, authorized withdrawal; and *CR*, credit.

An average of *B* or better is required for the Master's degree. The grade of *C* is not considered as failing but must be counter-balanced by a grade of *A* in a graduate course of equal status.

A Master's candidate who receives a grade of *F* is required to present cause for consideration by the Dean's Council as to why he should be allowed to continue his studies.

Whenever a grade has not been assigned, the symbol *I* (incomplete) or the symbol *W* (authorized withdrawal) will be recorded. The symbol *I* indicates that a satisfactory explanation has been given to the instructor for the student's failure to complete the required work of the course. An "incomplete" cannot be made up after the lapse of one calendar year except by written permission of the Dean's Council. An incomplete which is not removed within one calendar year is automatically changed to an *F*. An incomplete cannot be removed by reregistering for the course.

REQUIRED COURSES IN ADMINISTRATION (Certain Fields)

The following courses in general administrative theory and practice are *required* of all candidates for the degree of Master of Public Administration and Master of Business Administration, except in the field of Accounting. They are also required of candidates for the degree of Master of Arts in Government in the field of Personnel Administration.

	Semester Hours
Mgt 201: Advanced Administrative Management.....	3
Mgt 204: Quantitative Factors in Administration.....	3
Mgt 207: Human Behavior in Organizations.....	3

In addition, each student is normally required to take, from the following group, the course appropriate to his specific area of concentration:

	Semester Hours
B Ad 257: Operation of the Multinational Firm.....	3
B Ad 297: Case Studies in Business Administration.....	3
HCA 206: Case Studies in Health Care Administration.....	3
P Ad 298: Case Studies in Public Administration.....	3

THE THESIS

The thesis subject should be selected as early as possible so as to permit effective integration with the course work.

The subject must be approved by the professor in charge of the student's field. The thesis in its final form must have the approval of the professor in charge and must be presented to the Dean by the student no later than the date announced in the calendar. Printed copies of detailed regulations regarding the form and reproduction of the thesis are available in the Office of the Dean.

Payment of tuition for the thesis entitles the candidate, during the two semesters he registers for thesis (299-300), to the advice and direction of the member of the Faculty under whom the thesis is to be written. In case a thesis is unfinished, an additional successive academic year is granted without further tuition payment. The student must, however, maintain continuous registration

during this period. If the preparation of the thesis extends more than three semesters beyond the date he registers for thesis 300, the student must register for the entire six hours of thesis again and pay tuition as for a repeated course.

MASTER OF BUSINESS ADMINISTRATION

Curricula leading to the professional degree of Master of Business Administration are available in the fields of Accounting, Business Administration, Health Care Administration, International Business, and Personnel Administration.

The purpose of the programs leading to the degree of Master of Business Administration is to develop the analytical ability and perspective which will contribute to success as a responsible executive. Because of the increasingly close relationship between government and business, these programs also provide an excellent background for many government careers. To provide maximum flexibility, each student program is planned with an assigned faculty adviser.

An applicant must have a Bachelor's degree from an accredited college or university.

The degree is awarded by vote of the Faculty upon satisfactory passing of the Master's Comprehensive Examination, and the submission of an acceptable thesis. The complete program consists of 60 semester hours, 54 hours of course work and 6 of thesis. A student who has completed an undergraduate major in accounting or in business administration with a good record *may qualify* under a minimum acceptable program of 30 hours, including the thesis. No more than 6 hours of graduate course credits can be transferred from other accredited institutions, and each transfer of credit must be approved by the Dean.

The Master's Comprehensive Examination should ordinarily not be taken before the last semester of course work.

ACCOUNTING

The Master's programs in Accounting are designed (1) for those who wish to pursue careers as professional accountants, (2) for those who wish to pursue careers of executive responsibility with emphasis on finance and accounting in either business or government, and (3) for those who wish to pursue careers as teachers of accounting. Programs are sufficiently flexible to meet individual student objectives; selection of courses is made in consultation with the adviser. The programs are available in three basic areas, professional accounting, governmental accounting, and managerial accounting.

BUSINESS ADMINISTRATION

The Master's programs in Business Administration are designed for those who wish to pursue responsible careers as administrators in either government or business.

Individual programs are planned in consultation with the adviser to fit the professional objectives of the student. The course work must include the *required* courses in administration (see page 140). Fields of study include administrative theory and practice (required), behavioral factors in administration,

managerial economics, business-government relations, business statistics, data processing, finance and investments, international business, managerial accounting, marketing, operations research and systems analysis, personnel management, procurement and contracting, research and development management, and transportation.

HEALTH CARE ADMINISTRATION

The programs in Health Care Administration lead to the degrees of Master of Arts in Health Care Administration, Master of Business Administration, or Master of Public Administration. Study in depth may be made in various aspects of Health Care Administration found in short-term hospitals, long-term health facilities (such as extended care institutions, nursing homes, mental hospitals, facilities for the aged), group practice clinics, health information systems, and comprehensive health planning agencies. The basic curriculum for the degree of Master of Arts in Health Care Administration is developed in keeping with the background and professional goals of each student and ordinarily consists of 45 semester hours of course work; in no instance will the minimum be less than 36 semester hours plus supervised field experience. The basic curriculum for the Master of Business Administration and Master of Public Administration programs, which include the *required* courses in administration (see page 140), consists of from 45 to 60 semester hours, including 9 semester hours of residency, depending upon the background and experience of each student.

Ordinarily full-time students can expect to complete the on-campus phase of the degree program in two to four semesters over a period of one to two academic years. The total time depends on the past academic course work and experience background in the health care field.

HOSPITAL ADMINISTRATION

The program in Hospital Administration is divided into two phases. During the first phase the student must complete a satisfactory academic program of course work, selected in accordance with his background and needs. These courses cover the general and technical background of hospital administration, general administrative theory and practice, and problem solving in the area of management as it relates to short-term hospitals. The second phase is a calendar year of either on-the-job residency* under qualified administrative supervision or supervised field experience, for which the student receives up to 9 semester hours of academic credit. A written major report is required as part of phase two.

ADMINISTRATION OF LONG-TERM CARE FACILITIES

The concentration in the Administration of Long-term Care Facilities is designed to prepare students for the administration of facilities for the aged, extended care facilities, and mental hospitals.

During the first phase the student must complete a satisfactory academic program of course work, selected in accordance with his background and needs. These courses cover the general technical background of hospital administra-

* In selected cases, a combined residency can be arranged in more than a single concentration.

tion, general administrative theory and practice, and problem solving in the management of long-term care facilities. The second phase is a calendar year of either on-the-job residency* under a qualified administrative supervisor or supervised field experience, for which the student receives up to 9 semester hours of academic credit. A written major report is required as part of phase two.

HEALTH INFORMATION SYSTEMS

The concentration in Health Information Systems recognizes the rapidly growing demand for individuals who can develop and implement the use of computer-based information systems in decision-making approaches. It is designed to prepare those who wish to supervise and coordinate data collection, processing, and retrievable activities for health care complexes.

During the first phase the student must complete a satisfactory academic program of course work, selected in accordance with his background and needs. These courses cover the general and technical background of hospital administration and general administrative theory and practice. In addition required courses in computer services and information handling must be included. The second phase is a calendar year of either on-the-job residency* under a qualified administrative supervisor or supervised field experience in one or more health care facilities, for which the student receives up to 9 semester hours of academic credit. A written major report is required as part of phase two.

INTERNATIONAL BUSINESS

The Master's program in International Business is designed to prepare students for careers in firms operating on a multinational basis or about to enter the international field; for careers in the Federal Government and in international agencies concerned with business, industry, and finance abroad; and for the Commerce option of the Foreign Service Officer Examination.

This program is also designed to provide foreign students with the background and skills necessary to promote international business, and to prepare them for careers in foreign and domestic firms within their own countries and for commercial officer positions within their governments.

Each student's program is individually developed by the student's adviser according to the student's background and interests, and includes the *required* courses in administration (see page 140).

PERSONNEL ADMINISTRATION

The program in Personnel Administration leads to the degree of Master of Business Administration (if elective emphasis is directed toward Business Administration), to the degree of Master of Public Administration (if elective emphasis is directed toward Public Administration), or to the degree of Master of Arts in Government.

The course work must include the *required* courses in administration, page 140, and the thesis (B Ad 299-300 or P Ad 299-300). Each student's program is arranged in consultation with a curriculum adviser.

* In selected cases, a combined residency can be arranged in more than a single concentration.

MASTER OF PUBLIC ADMINISTRATION

Curricula leading to the professional degree of Master of Public Administration are available in the fields of Health Care Administration, Personnel Administration, Public Administration, and Urban and Regional Planning.

PUBLIC ADMINISTRATION

This program provides a course of study appropriate for those students currently in government or with appreciable past experience in government, or those with other than an undergraduate social science degree. The degree of Master of Public Administration is a professional degree, preparing graduates for positions of higher responsibility in the public service and generally improving their competence in public employment. Work done for this degree may lead directly toward the degree of Doctor of Public Administration.

The degree is awarded by vote of the Faculty upon satisfactory passing of the Master's Comprehensive Examination and the submission of an acceptable thesis. The academic program ranges from 36 to 60 semester hours, depending upon the background and experience of each student. Six semester hours in the program represent major research and preparation of a thesis. Students who have strong undergraduate backgrounds in political science, history, economics, business administration, sociology, or psychology, or who have had appropriate career experience closely related to such fields, will ordinarily require a minimum amount of course work to qualify for the degree. Each student develops an individual program in consultation with his faculty adviser to prepare for the Master's Comprehensive Examination.

No more than 6 hours of graduate credit can be transferred from other accredited institutions, and any transfer of credit must be approved by the Dean.

The course work for the degree of Master of Public Administration must include the *required* courses in administration, page 140. Other courses are selected, with the approval of the adviser, to prepare the student for the Master's Comprehensive Examination, which covers three fields of study. The field of administrative theory and practice is required of all students. The other two fields may be chosen from administration in the Federal Government, comparative and development administration, data processing and systems management, government-business relations, health care administration, human behavior in organizations, international administration and trade, metropolitan administration and urban affairs, public financial management and budgeting, public personnel administration, regional planning, urban planning and design, and closely related management and social science fields.

A thesis, which may be a major case study, is prepared under the guidance of an approved director.

HEALTH CARE ADMINISTRATION

The programs in Health Care Administration are described on pages 142-43, and lead to the degree of Master of Arts in Health Care Administration, Master of Business Administration, or Master of Public Administration.

PERSONNEL ADMINISTRATION

The program in Personnel Administration leads to the degree of Master of Public Administration (if elective emphasis is directed toward Public Administration), to the degree of Master of Business Administration (if elective emphasis is directed toward Business Administration), or to the degree of Master of Arts in Government.

The course work must include the *required* courses in administration, page 140, and the thesis (P Ad 299-300 or B Ad 299-300). Each individual student's program is arranged in consultation with a curriculum adviser.

URBAN AND REGIONAL PLANNING

The program in Urban and Regional Planning is designed to provide an introduction to planning theory and methodology for students who are working toward the degree of Master of Public Administration. The standards for the program are similar to those for the Public Administration curriculum outlined on page 144. The student is expected to include public administration, federal or metropolitan, as an integral part of his studies. With the counseling of an adviser, each program is individually planned in accordance with the interest and goal of the student.

MASTER OF URBAN AND REGIONAL PLANNING

The program of graduate study in Urban and Regional Planning leads to the professional planning degree of Master of Urban and Regional Planning. It is designed as preparation for careers on the municipal, county, state, and national levels, and for private professional practice. The course of study is designed to provide a broad professional education, to develop competence in planning and methodology, and to emphasize the analytical ability and creativity necessary for solving urban and regional problems. Each student's program is designed in consultation with an assigned faculty adviser in accordance with his individual career plans.

The degree is awarded by vote of the Faculty after satisfactory completion of (1) from 45 to 60 semester hours of course work, depending upon the background and experience of each individual student, including a thesis equivalent to 6 semester hours (most students will ordinarily be required to take 60 semester hours); (2) a minimum of three months' full-time professional training in a planning agency under qualified supervision, with an acceptable written report to be submitted after completion of the training period; (3) a written Master's Comprehensive Examination; and (4) a thesis based on the candidate's research in the field of urban and regional planning.

MASTER OF ARTS IN GOVERNMENT

Curricula leading to the degree of Master of Arts in Government are available in the fields of Business and Economic Statistics, Personnel Administration, Public Administration, and Urban and Regional Planning.

The programs leading to this degree require a minimum of 36 semester hours of work, which includes a thesis equivalent to 6 semester hours.

Second-group courses (numbered 101–200) may be counted toward the Master's degree up to a maximum of 12 hours, but only when registration for graduate credit has been approved at the beginning of the course by the faculty adviser and instructor. No work counted toward a Bachelor's degree may also be counted toward a Master's degree.

BUSINESS AND ECONOMIC STATISTICS

Prerequisite: an undergraduate major in Business and Economic Statistics, or the equivalent; such work must include a minimum of 24 semester hours of second-group courses in statistics and a minimum of 10 semester hours in second-group courses in accounting, business administration, and economics.

This program requires at least 12 semester hours of graduate courses in statistics. The remaining courses are to be selected from graduate offerings in accounting, business administration, economics, public administration, and statistics with the approval of the adviser. A thesis equivalent to 6 semester hours is required.

PERSONNEL ADMINISTRATION

The program in Personnel Administration leads to the degree of Master of Arts in Government, to the degree of Master of Business Administration (if elective emphasis is directed toward Business Administration), or to the degree of Master of Public Administration (if elective emphasis is directed toward Public Administration).

The course work must include the *required* courses in administration, page 140, and the thesis (B Ad 299–300 or P Ad 299–300). Each individual student's program is arranged in consultation with a curriculum adviser.

PUBLIC ADMINISTRATION

The program, in contrast to the professional program leading to the degree of Master of Public Administration (see page 144) is designed for students who wish to emphasize the academic elements of public administration. It may also serve as a basis for later study toward the doctoral degree. It is a suitable degree objective for students who have just completed the Bachelor's degree.

Each student is expected to prepare himself for a Master's Comprehensive Examination, which covers three fields. The field of administration and policy formulation in government is required. The other two may be selected from such fields as comparative and developmental administration, data processing and systems management, government-business relations, human behavior in organizations, international administration and trade, metropolitan administration and urban affairs, public financial management and budgeting, public personnel administration, regional planning, and urban planning and design. Related studies may be selected from accounting, economics, geography, history, political science, psychology, and sociology.

The course work is planned with an adviser.

URBAN AND REGIONAL PLANNING

The program in Urban and Regional Planning leading to the degree of Master of Arts in Government is designed to provide planning theory and methodology

for students who have an undergraduate degree in the social sciences. The student is expected to include public administration, federal or metropolitan, as an integral part of his studies, as well as courses in urban planning and design or regional planning. Under the counseling of an adviser, each program is individually planned in accordance with the interest and goal of the student.

MASTER OF ARTS IN HEALTH CARE ADMINISTRATION

Curricula leading to the degree of Master of Arts in Health Care Administration are available with concentrations in Hospital Administration, Administration of Long-term Care Facilities, Health Information Systems, and Comprehensive Health Planning.

HOSPITAL ADMINISTRATION

The concentration in Hospital Administration is described on page 142, and leads to the degree of Master of Arts in Health Care Administration, Master of Business Administration, or Master of Public Administration.

ADMINISTRATION OF LONG-TERM CARE FACILITIES

The concentration in Administration of Long-term Care Facilities is described on pages 142-43, and leads to the degree of Master of Arts in Health Care Administration, Master of Business Administration, or Master of Public Administration.

HEALTH INFORMATION SYSTEMS

The concentration in Health Information Systems is described on page 143, and leads to the degree of Master of Arts in Health Care Administration, Master of Business Administration, or Master of Public Administration.

COMPREHENSIVE HEALTH PLANNING

The concentration in Comprehensive Health Planning leads to the degree of Master of Arts in Health Care Administration. This program is designed to prepare students to plan for and coordinate all aspects of private and public health care systems in accordance with sound management principles. It is an interdisciplinary program, and includes course offerings in the areas of environmental health, medical care organization, sociology, and urban and regional planning.

The first phase of the program consists of the required courses in health care administration, plus required courses in comprehensive health planning. The second phase consists of supervised field experience. A written major report is required as part of phase two.

Graduate Certificate in Health Care Administration

STUDENTS WITH APPROVED MASTER'S DEGREES from accredited institutions may take a special post-Master's program leading to a Graduate Certificate in Health Care Administration. Each program will be planned to meet the professional needs of the individual student whether he wishes to undertake a new field of study or to amplify his knowledge of work done at the Master's level.

This program permits study in depth of such areas as health care administration consulting; comprehensive health planning; government health care administration at federal, state, and county levels; long-term care administration, including mental hospitals, nursing homes, and facilities for the aged; and health care administration research.

Prerequisite: a Master's degree from an accredited college or university and an academic average which indicates the ability to undertake advanced study. The applicant is also judged on his experience, character, and personality. Applicants lacking formal study in health care administration are required to take qualifying courses.

REQUIREMENTS FOR THE CERTIFICATE

Students with adequate preparation in the health care field can complete the requirements with a minimum of 18 semester hours of approved graduate study. Those lacking such specialized study or equivalent experience will usually need to complete a minimum of 30 semester hours. At the discretion of the student's advisory committee a maximum of 6 semester hours may be transferred from another accredited institution if the work was taken for credit toward a graduate degree.

PROGRAM OF STUDIES

HCA 270 *Research in Health Care Administration* is required of all candidates for the Certificate. The remaining courses consist of a program of study worked out in consultation with a faculty adviser and planned with consideration of the student's educational and experience background and his specific professional objectives.

Doctoral Study

WORK FOR THE DEGREES of Doctor of Business Administration and Doctor of Public Administration is under the supervision of the Committee on Doctoral Studies.

ADMISSION

Completed application forms must be sent to the Office of the Admissions Officer, the School of Government and Business Administration, George Washington University, Washington, D.C. 20006. The applicant should ask three individuals, who are acquainted with his ability to do high-level academic work, to write directly to the Chairman of the Committee on Doctoral Studies.

These letters of reference should be on special forms which will be provided by the Committee Chairman. Applicants for the degree of Doctor of Business Administration must file results of the Admission Test for Graduate Study in Business with the Office of the Admissions Officer before final approval of their applications can be given. Applicants for the degree of Doctor of Public Administration must submit results of either the Admission Test for Graduate Study in Business or the Graduate Record Examination to the Office of the Admissions Officer. These tests must have been taken within the past five years. Arrangements to take these tests must be made with the Educational Testing Service, 20 Nassau Street, Princeton, N.J. 08540; or 1947 Center Street, Berkeley, Calif. 94704.

An applicant must have a degree of Master of Business Administration or Master of Public Administration, as appropriate; or a Master of Arts degree in an approved field; or the equivalent, together with acceptable personal qualities and a capacity for creative scholarship. Each applicant must demonstrate his competence by qualifying examinations.

PLAN OF STUDY

The Chairman of the Committee on Doctoral Studies, in consultation with the applicant, will (1) designate fields of study selected from such areas as Business Administration, Economics, Health Care Administration, International Business, Public Administration, Political Science, and Urban and Regional Planning; and (2) appoint an adviser to guide the student in his work in these fields. Most students will complete, prior to the General Examination, a minimum of 30 semester hours in graduate courses and such additional course work as may be prescribed by the adviser; but, the exact content of each program is determined in light of the student's background and competence after consultation with the appropriate faculty member in each of the fields undertaken.

Full-time students are normally expected to register for 9 to 12 semester hours each semester. All work for the Doctor's degree must be completed in five years unless an extension of time is granted by the Committee on Doctoral Studies prior to the expiration of the time limit. All course work must be taken on campus unless otherwise approved in advance by the Dean.

When the applicant has satisfied his adviser and the Committee of his readiness to take the General Examination in the fields of study previously designated, the examination will be scheduled during the following February or October.

Upon successful completion of the General Examination and approval of the subject of the doctoral dissertation, the student may be admitted to candidacy by the Committee on Doctoral Studies. The candidate's research and the preparation of his dissertation are supervised by a Research Adviser designated by the Committee.

After admission to candidacy, the student must register for 24 hours of *Dissertation Research* (399). Full-time students must register for 9 to 12 hours a semester for 2 semesters, and for sufficient hours in the third semester to complete the 24-hour requirement. Part-time students must register for 6 semester hours a semester for 4 semesters. If the dissertation has not been completed during the time the student has registered for the required 24 hours, he must register for 3 semester hours of *Dissertation Research* (399) each succeeding

semester until the satisfactory completion of the dissertation and the final oral examination.

THE DISSERTATION

A dissertation is required as evidence of ability to perform scholarly research and to interpret and present its results.

No later than the date specified in the calendar the candidate must submit to the Dean three complete copies of the dissertation and an original copy of an abstract of his dissertation for inclusion in the announcement of the examination and for reproduction by University Microfilms, Inc.

Printed copies of detailed regulations regarding the form and reproduction of the dissertation, preparation of the abstract, and services offered by University Microfilms, Inc., are available in the Office of the Dean. The successful candidate for the doctorate is required, before receiving his degree, to pay a fee to cover the expense of printing the abstract of his dissertation, and for the basic service rendered by University Microfilms, Inc.

THE FINAL EXAMINATION

The Final Examination of the candidate consists of his oral defense of the dissertation. The examination will be given by a committee appointed by the Committee on Doctoral Studies. Upon successful completion of this oral examination the candidate will be approved for the degree of Doctor of Business Administration or Doctor of Public Administration by the Committee on Doctoral Studies.

RESIDENCE

The Committee on Doctoral Studies expects all students to remain registered until *all* degree requirements are satisfied, although there is no formal regulation concerning the minimum amount of time of study either in preparation for the General Examination or as a doctoral candidate engaged in research. The student who undertakes either part of the doctoral program on full or limited schedule must maintain "continuous registration" under the School of Government and Business Administration even when he is granted a leave of absence for study or residence elsewhere. By failing to register for one semester or more, the student breaks his registration and must apply for readmission to the School under whatever new conditions and regulations are set up by the Committee or the member of the Faculty who directs his research. The student who has completed his tuition requirements, but whose graduation is deferred for any reason, must maintain continuous registration by paying the continuous registration fee for the semester immediately preceding the graduation at which he expects to receive his degree.

Special Programs

GOVERNMENT MANAGEMENT INTERN SCHOLARSHIP PROGRAM

THE GOVERNMENT MANAGEMENT INTERN SCHOLARSHIP PROGRAM offers annually fifty scholarships to assist federal agencies in training carefully selected young men and women for administrative leadership in government career service. Each scholarship provides a tuition-free course of 3 semester hours a semester, and interns who maintain satisfactory standing in both their academic program and their government training program may qualify for extension of the scholarship for one additional semester.

NAVY GRADUATE FINANCIAL MANAGEMENT PROGRAM

The Navy Graduate Financial Management Program, sponsored by the Naval Postgraduate School, provides 50 semester hours of work in financial management and related fields for a selected group of Naval and Marine officers. The Master of Business Administration degree is awarded upon successful completion of this full-year program.

CONTINUING EDUCATION IN HEALTH CARE ADMINISTRATION

A nondegree program is conducted in the various areas of health care administration both on campus and off campus whenever a sufficiently large class is organized. Institutes, workshops, and lecture series are conducted under the auspices of program faculty and selected leaders from local, state, and regional areas on topics of current interest to the requesting organization. No specific prerequisite is required. Fees are to be announced.

THE INTERNATIONAL INSTITUTE FOR HEALTH CARE ADMINISTRATION

In recognition of special educational needs of students from other countries, The International Institute for Health Care Administration offers programs of instruction designed to meet these needs either at degree or certificate level.

It is also equipped to enter into arrangements with principals of hospital systems in world-wide areas to assist in the preparation of teaching programs or the actual instruction of administrative personnel either abroad or at the University.

THE MANAGEMENT RESEARCH GROUP

The Management Research Group seeks to serve government and industry and commerce by contributing to the development and understanding of basic theory in the field of management. The Group also provides assistance in translating theory into practice.

Relationships and techniques important to modern information flow and managerial decision making are stressed. The research conducted extends to system design, analysis of system performance, and the evaluation of practice in relation to managerial criteria.

CERTIFICATION OF CHARTERED LIFE UNDERWRITERS

The Department of Business Administration cooperates with the District of Columbia Chapter of the Chartered Life Underwriters in sponsoring courses designed to prepare candidates for certificate examination. Inquiries should be addressed to the Chairman of the Educational Committee, District of Columbia Chapter, CLU, Suite 1020, 1100 Vermont Avenue, N.W., Washington, D.C. 20005; or telephone: 223-4000.

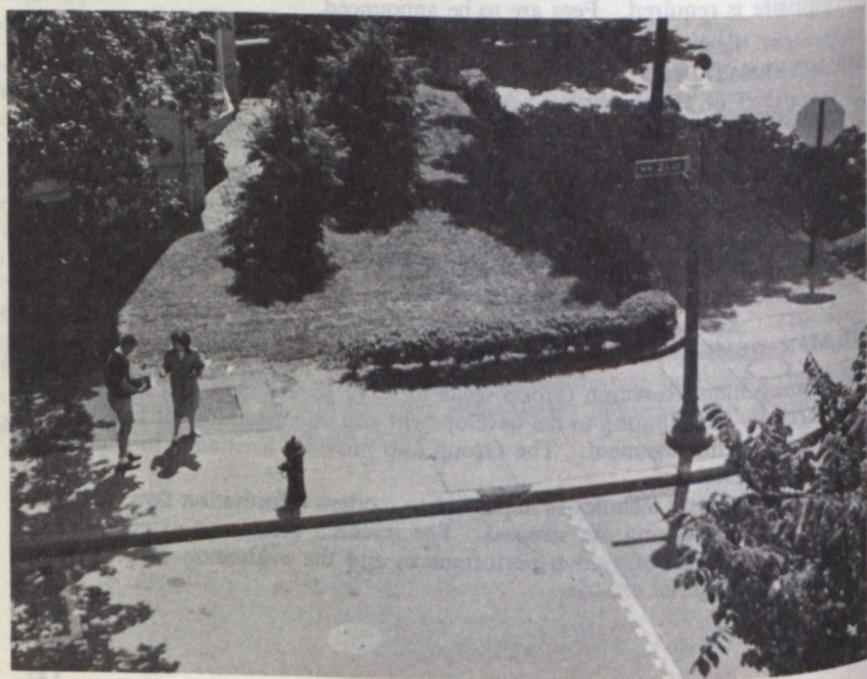
CERTIFICATION OF PUBLIC PURCHASING AGENTS

The School of Government and Business Administration participates in the National Institute of Governmental Purchasing professional certification program. Courses and examinations leading to qualification as "Certified Public Purchasing Officer" (CPPO) are provided. Inquiries may be directed to the School or to the National Institute of Governmental Purchasing, 1001 Connecticut Avenue, N.W., Washington, D.C. 20036.

OFF-CAMPUS DEGREE PROGRAMS

The School of Government and Business Administration has academic jurisdiction over off-campus programs leading to the following degrees: Bachelor of Science in General Studies with concentrations in accounting and business administration and the Master of Science in Administration.

These degree programs are administered by the College of General Studies. For details concerning the off-campus programs, see the *College of General Studies Catalogue*.



SCHOOL OF PUBLIC AND INTERNATIONAL AFFAIRS

Dean B.M. Sapin

FACULTY

Professors Joseph Aschheim, J.W. Brewer, A.E. Burns, R.H. Davison, C.E. Galbreath, Andrew Gyorgy, H.C. Hinton, W.C. Hopkins, J.W. Kendrick, W.H. Kraus, H.L. LeBlanc, H.M. Merriman, F.H. Michael, J.N. Mosel, Benjamin Nimer, F.T. Peck (*Visiting*), Vladimir Petrov, R.E. Purcell, Mario Rodríguez, H.M. Sachar, B.M. Sapin, C.B. Sargent, R.P. Sharkey, George Stambuk, C.T. Stewart, Jr., H.M. Stout, R.B. Thompson, D.S. Watson, R.K. White, Kurt Wilk (*Visiting*), Helen Yakobson
Associate Professors R.M. Dunn, Jr., C.F. Elliott, P.P. Hill, Ching-Yao Hsieh, W.R. Johnson, J.K. McDonald, J.A. Morgan, Jr., C.A. Moser, Sidney Ploss (*Research*), Bernard Reich, Chung-wen Shih, Richard Thornton, R.Y.C. Yin
Assistant Professors D.T. Allensworth, Anita Dasbach, D.L. Lee, G.C.Y. Wang, S.J. Wayne, J.M. Logsdon

Instructor K.L. Storrs

COMMITTEES*

DEAN'S COUNCIL

D.T. Allensworth, C.F. Elliott, Andrew Gyorgy, P.P. Hill, H.C. Hinton, W.R. Johnson, H.L. LeBlanc, J.A. Morgan, Jr., Vladimir Petrov, Bernard Reich

COMMITTEE ON PROGRAMS AND CURRICULUM

H.C. Hinton, H.L. LeBlanc, Benjamin Nimer, H.M. Stout

COMMITTEE ON ADMISSION AND ADVANCED STANDING

F.H. Michael (*Chairman*), C.F. Elliott, Andrew Gyorgy, W.R. Johnson, J.A. Morgan, Jr.

COMMITTEE ON CHINESE STUDIES

W.R. Johnson (*Chairman*), H.C. Hinton, F.H. Michael, Chung-wen Shih, Richard Thornton, R.Y.C. Yin

* The Dean of the School is an ex officio member of all committees.

ADVISORY BOARD ON THE INSTITUTE FOR SINO-SOVIET STUDIES

B.M. Sapin (*Chairman*), Joseph Aschheim, W.R. Johnson, W.H. Kraus, F.H. Michael, Benjamin Nimer, Chung-wen Shih, R.B. Thompson, Helen Yakobson

INTRODUCTION

The study of Government was first organized as a separate entity in the University in 1898 with the establishment of the School of Comparative Jurisprudence and Diplomacy. In 1928, this School was reorganized and broadened as the School of Government. During the next two decades, programs in business administration and public administration were added, and the emphasis gradually shifted from undergraduate to graduate study. The name was changed in 1960 to the School of Government, Business, and International Affairs to reflect more accurately the offerings of the School. A division of the School was effected in 1966, and two schools were established—the School of Government and Business Administration, a primarily professionally-oriented school; and the School of Public and International Affairs, a primarily policy-oriented school.

Programs of the School of Public and International Affairs are interdisciplinary, and emphasize governmental policy, both domestic and foreign.

Students in the freshman and sophomore years are registered in the lower division of Columbian College of Arts and Sciences, the liberal arts college of the University. Here they are assigned special advisers from this School to assist them in planning their programs.

ACADEMIC PROGRAMS

Programs available within the School of Public and International Affairs are an undergraduate field in Chinese Studies, undergraduate and graduate fields in International Affairs and Public Affairs, and a graduate field in Russian Studies. Special programs in Soviet, Chinese, and East European studies are offered by the School's Institute for Sino-Soviet Studies.

OBJECTIVES

Each of the three undergraduate programs of study is aimed at preparing the student to understand major contemporary issues in international affairs or in domestic public affairs. The programs are designed not to produce narrow professional specialists, but to foster a liberal education, interdisciplinary in nature and broader than a concentration in one of the conventional disciplines. In each program there is a double effort: to develop a background as broad and as deep as possible in order to assist in the understanding and analysis of modern problems, and to give instruction in some useful tools of analysis.

The graduate programs leading to the degree of Master of Arts are more concentrated. The student is expected to develop a greater competence in an area or a discipline, building on his undergraduate program in preparation for professional employment in government, in international organizations, in business, or in private agencies concerned with public or international affairs.

REGULATIONS

Regulations concerning ADMISSION, REGISTRATION, FEES AND FINANCES are stated on pages 23-33; other University regulations, on pages 43-51.

ATTENDANCE

A student may not attend classes until registration is completed and fees due are paid. A student may be dropped from any course for undue absence.

The student is held responsible for all the work of the courses in which he is registered, and all absences must be excused by the instructor in charge before provision is made for him to make up the work missed.

A student suspended for any cause may not attend classes during the period of suspension.

The Degree of Bachelor of Arts

THE SCHOOL OFFERS PROGRAMS leading to the degree of Bachelor of Arts in the fields of Chinese Studies, International Affairs, and Public Affairs.

ENTRANCE REQUIREMENTS

The satisfactory completion of the *Chinese Studies and International Affairs*, or *Public Affairs* curriculum in the lower division of Columbian College of Arts and Sciences (see page 82), or the equivalent, is required.

REQUIREMENTS FOR THE DEGREE

ACADEMIC WORK LOAD

A full-time student not on probation may not ordinarily take more than 15 semester hours. A student employed more than 24 hours a week who is not on probation may not take more than 9 semester hours.

A full-time student with Honors grades, or higher, in 60 percent of his course work may take not more than 18 semester hours. A student employed more than 24 hours a week who has Honors grades in 60 per cent of his course work may take up to 12 semester hours.

A student who accepts employment after registration or at any time during a semester must report immediately to the Dean, so that his program may be adjusted if necessary.

Exception to these rules will require the approval of the Dean.

SCHOLARSHIP

In order to graduate, a student must have the following: (1) 124 semester hours of passing grades and (2) High Pass or Honors grades in half the courses taken in the major. The major includes the required courses and courses taken in the group options.

DEAN'S HONOR LIST

The name of every student who achieves Honors grades in at least 60 per cent of his course work is placed on the Dean's Honor List for that semester. Appearance on the List will be limited to (1) full-time students registered for a minimum of 12 semester hours and (2) part-time students registered for a minimum of 12 semester hours over a period of two consecutive semesters, which may include a summer term.

ACADEMIC STANDING

A student who is not suspended or on probation is considered to be in good standing.

The following rules governing probation and suspension are applicable as stated to students enrolled for a full-time program (12 semester hours or more) during the fall or spring semester. Students enrolled for less than 12 semester hours during the fall or spring semester and students enrolled during the summer sessions are subject to probation or suspension on the basis of their record for 12 semester hours, or multiples thereof, rather than on their record in any one semester.

PROBATION

A student who in one semester receives two grades of Fail in courses carrying 3 or more semester hours of credit each, or the equivalent, is placed on probation. A student on probation who receives one grade of Fail in such a course will be continued on probation for a second semester. A student on probation taking 12 or more semester hours whose grades are all Pass or better is removed from probation.

SUSPENSION

A student who in one semester receives grades of Fail in three courses carrying 3 or more semester hours of credit each, or the equivalent, is suspended. A student on probation who receives two or more grades of Fail in such courses is suspended. A student who receives one or more grades of Fail in such courses in a second semester on probation is suspended.

A student who is suspended for poor scholarship may apply for readmission after the lapse of either the fall or spring semester. To be considered for readmission, he must pass prescribed tests and submit evidence to the Dean's Council that during his absence from the University he has so conducted himself as to indicate that he will profit by readmission. A student readmitted after suspension is on probation. In no case will the probationary period after readmission exceed 24 hours of study. A student suspended twice for poor scholarship will not be readmitted.

RESIDENCE

A minimum of 30 semester hours, including at least 12 hours in the major field, must be completed while registered in the School of Public and International Affairs. This requirement applies to students transferring within the University as well as to students transferring from other institutions. Summer work may

be counted toward the residence requirement, but in no case may the period of residence aggregate less than thirty weeks. Unless special permission is granted by the Dean to pursue work elsewhere, the work of the senior or final year must be completed in the School of Public and International Affairs.

USE OF CORRECT ENGLISH

Any student whose written or spoken English in any course is unsatisfactory may be reported by the instructor to the Dean. The Dean may assign supplementary work, without academic credit, varying in amount with the needs of the student. If the work prescribed is equivalent to a course, the regular tuition fee is charged. The granting of a degree may be delayed for failure to make up any such deficiency in English to the satisfaction of the Dean.

STUDY ABROAD

Students wishing to study abroad must consult with their advisers and the Dean, because arrangements must be made on an individual basis. Students of international affairs are encouraged to travel and study abroad.

CORRESPONDENCE AND HOME-STUDY COURSES

Credit for correspondence or home-study courses is not acceptable and cannot be applied toward a degree.

CURRICULUM REQUIREMENTS

To be recommended by the Faculty for graduation, candidates are required to complete, in addition to the appropriate freshman and sophomore work, a minimum of 60 semester hours during the junior and senior years, as set forth in one of the following curricula.

EXAMINATIONS FOR WAIVING CURRICULUM REQUIREMENTS

A required course may be waived by the satisfactory passing of a waiver examination authorized and prescribed by the department or curriculum adviser concerned. Passing this examination does not entitle the student to any hours of credit toward the degree. Request to take the examination should be made to the curriculum adviser and the required fee paid at the Office of the Cashier before the date set for the examination.

CHINESE STUDIES

The Chinese Studies program is designed to introduce the student to a non-Western culture and to provide an understanding of the history, politics, and economy of modern China. The program is interdepartmental and is recommended for students who wish a comprehensive study of one of the world's major civilizations and for those who contemplate graduate study in Chinese or Far Eastern Affairs.

All Chinese Studies majors must complete 24 semester hours of *required* courses and 36 semester hours (including electives) in one area of concentration selected from Economics, History, or Political Science (see page 371).

INTERNATIONAL AFFAIRS

The International Affairs program covers international political relations, international economics, international communications, and regional studies. Its purposes are to provide an understanding of the forces operative in the contemporary world—political, economic, and social—and to give the student an awareness of major international problems and the role of the United States as a world power.

All International Affairs majors must complete 30 semester hours of required courses (see pages 371–72), 15 hours to be selected in consultation with the adviser from one of the following group options, and 15 hours of electives.

Group I: International Politics.—Courses concerned with theory and practice in international affairs, forces shaping the world scene, and American foreign policy.

Group II: International Economics.—Courses concerned with the world economy and American policy and practice in international trade and finance.

Group III: International Communications.—Courses concerned with the study of international information programs, public opinion, psychological warfare, cultural relations, and public relations.

Group IV: Regional Study.—Integrated program of study on Europe, Africa, the Middle East, the Far East, the Soviet Orbit, or Latin America.

PUBLIC AFFAIRS

The Public Affairs program is a composite curriculum dealing with domestic government and policy.

All Public Affairs majors must complete 30 semester hours of required courses, 12 hours in a group option—economics, politics, or urban affairs—and 18 hours of electives (see page 372).

The Degree of Master of Arts

THIS SCHOOL OFFERS PROGRAMS leading to the degree of Master of Arts in the fields of International Affairs, Public Affairs, and Russian Studies.

ENTRANCE REQUIREMENTS

A Bachelor's degree from an accredited college or university, with a *B* average, or the equivalent, in the relevant undergraduate field, is required.

In the field of International Affairs.—The applicant's undergraduate program should have included background courses corresponding to an undergraduate major in international affairs at this University.

In the field of Public Affairs.—An undergraduate major in public affairs, economics, history, or political science, depending on the field of specialization, is required.

In the field of Russian Studies.—An undergraduate major in a pertinent field is required. The undergraduate program should have included the following courses, or equivalent: Hist 145-46; P Sc 112 or 161; Slav 1-2 and 3-4, or 5 and 6.

GENERAL REQUIREMENTS

A B average, or equivalent, in the undergraduate major is normally required for admission to graduate study. Deficiency in undergraduate preparation may be satisfied by (1) taking specified undergraduate courses and receiving Honors or High Pass grades in such courses or (2) passing a comprehensive examination in the major field. The examination may be taken only with the Dean's approval upon recommendation of the curriculum adviser.

The programs leading to the degree of Master of Arts require a minimum of 30 semester hours of work, including 24 hours of course work and a thesis equivalent to 6 semester hours. Most individual student programs exceed 30 hours, dependent upon the undergraduate major and other prerequisites.

Master's degrees are awarded by vote of the Faculty on completion of the required course work, an acceptable thesis, and the passing of the Master's Comprehensive Examination. An applicant whose background does not include the necessary courses or equivalent work experience must take a program longer than the minimum hours required.

Second-group courses (numbered 101-200) may be counted toward the Master's degree only when registration for graduate credit has been approved at the beginning of the course by the curriculum adviser and the Dean. Such approval is granted only with the provision that students must complete additional work in order to receive graduate credit. Normally, no more than 6 semester hours of 100-level courses may be taken for graduate credit. No work counted toward a Bachelor's degree may also be counted toward a Master's degree.

All work for a Master's degree must be completed in five years, unless an extension of time is granted by the Dean.

No credit is granted for work done *in absentia* or without formal instruction, except for the thesis, which may be completed *in absentia* with the permission of the curriculum adviser and the Dean. No more than 6 semester hours of graduate credit may be transferred from other accredited institutions, and these may be accepted only under limited conditions of time, grades, and relevance to the student's program.

A student who expects to continue his studies for the degree of Doctor of Philosophy in the field of International Relations after receiving the Master's degree in the field of International Affairs is strongly advised to plan from the beginning so that work for the lower degree will fit into a subsequent doctoral program in the Graduate School of Arts and Sciences (see pages 91-95, 97-99).

FOREIGN LANGUAGE REQUIREMENTS

A candidate for the degree of Master of Arts must show that he has a reading knowledge (certified by the appropriate language department) of at least one modern foreign language, to be approved by the Dean. The language examination should be taken before the student begins the second 15 hours of his work. No student may take the examination more than three times.

MASTER'S COMPREHENSIVE EXAMINATION

In addition to any course examinations, the candidate must pass a written Master's Comprehensive Examination. Examinations are scheduled two times a year (usually in December and April), and should be taken during the last semester of course registration or shortly after the completion of the prescribed course work. If there is a lapse of time between completion of course work and the examination, the student must maintain "continuous registration" during this period. The candidate must consult with his adviser, well in advance, as to the date of his examination and the definition of the subject-matter fields which this examination is to cover. An oral examination on his thesis or major report may also be required.

SCHOLARSHIP

Grades for graduate work are *A*, excellent; *B*, good; *C*, minimum pass; *F*, fail; *I*, incomplete; *W*, authorized withdrawal; and *CR*, credit.

An average of *B* or better is required for the Master's degree. The grade of *C* is not considered as failing but must be counter-balanced by a grade of *A* in a graduate course of equal status.

A Master's candidate who receives a grade of *F* is required to present cause for consideration by the Dean's Council as to why he should be allowed to continue his studies.

Whenever a grade has not been assigned, the symbol *I* (incomplete) or the symbol *W* (authorized withdrawal) will be recorded. The symbol *I* indicates that a satisfactory explanation has been given to the instructor for the student's failure to complete the required work of the course. An "incomplete" cannot be made up after the lapse of one calendar year except by written permission of the Dean's Council. An incomplete which is not removed within one calendar year is automatically changed to an *F*. An incomplete cannot be removed by reregistering for the course.

THE THESIS

The thesis subject should be selected as early as possible so as to permit effective integration with the course work.

The subject must be approved by the student's adviser. The thesis in its final form must have the approval of the professor in charge and must be presented to the Dean by the student no later than the date announced in the calendar. Printed copies of detailed regulations regarding the form and reproduction of the thesis are available in the Office of the Dean.

Payment of tuition for the thesis entitles the candidate, during the period of registration, to the advice and direction of the member of the Faculty under whom the thesis is to be written. In case a thesis is unfinished, an additional calendar year may be granted without further tuition payment. The student must, however, maintain continuous registration (see page 47) during this period. If the preparation of the thesis extends beyond the additional calendar year, the student must register for the entire 6 hours of thesis again and pay tuition as for a repeated course.

INTERNATIONAL AFFAIRS

Prerequisite: the applicant's undergraduate program should have included background courses corresponding to an undergraduate major in International Affairs at this University (see pages 371-72).

Any omission in the applicant's former program must be made up by appropriate courses in addition to the requirements for the Master's degree. The language requirement (see page 159) must be satisfied.

The Master's program in International Affairs is a flexible one, ranging from 30 to 60 hours, depending upon the background of the student. The student's particular responsibilities will be indicated in his letter of admission to the program and in the course of subsequent consultation with a program adviser, who will be assigned and with whom the student is required to confer.

A minimum of 24 hours of third-group courses, numbered above 200, and a thesis (6 semester hours), must be included in the program. Under special circumstances, up to 6 semester hours of second-group courses (101-200) may be taken for graduate credit and included in the 24 hours. In each case, graduate credit will be allowed only if approval has been given by the program adviser and the Dean at the time of registration for the course, and by the course instructor. The student who takes an undergraduate course for graduate credit is expected, by arrangement with the instructor, to do work at the graduate level in addition to the regular work of the course.

In addition to the satisfactory completion of his courses and the thesis, the student must pass a set of written examinations over three fields within the broad area of international affairs. The student will confer with his program adviser concerning the complete range of general, supplementary, and regional fields from which his three fields may be selected. The three fields must represent at least two disciplines.

Graduate courses should be selected, in consultation with the adviser, with a view to their relevance to the fields in which the student expects to be examined. Course work should be understood to be only partial preparation for the field examinations, and the student is expected to pursue a program of additional reading in each of his three fields, in accordance with the advice of the instructor responsible for instruction in the field.

The program in International Affairs offers three broad fields of study: general, supplementary or special, and regional. At least one general field must be included in the three fields the student selects. Graduate courses (numbered over 200) in anthropology, business administration, economics, history, political science, psychology, and sociology relate to these fields of specialization.

General Fields of Study.—International Politics, Comparative Government and Politics, Modern Political Theory (including Socialist and Communist Theory), and International Economics.

Supplementary or Special Fields.—International Law, International Organization and Administration, International Economic Development, International Communications, International and Comparative Aspects of Communism, U.S. Diplomatic History, and U.S. Foreign Policy.

Regional Fields.—Modern history, or government and politics, or economic history and problems of Western Europe, Eastern Europe, Soviet Union, Latin America, Middle East, Africa, South and Southeast Asia, and China.

Sino-Soviet Studies.—The Institute for Sino-Soviet Studies provides a program of interdisciplinary study centered on the problems of the Sino-Soviet areas and the international communist movement. Graduate studies under the auspices of the Institute are available to qualified students. Courses and seminars are designed to analyze the principles and problems of international communism and to study the policies, strategies, and tactics of the major communist powers (see pages 297–303).

PUBLIC AFFAIRS

Prerequisite: an undergraduate major in public affairs, economics, history, or political science, depending upon the field of specialization. Any course deficiency in the undergraduate Public Affairs curriculum, as stated on page 372, must be made up.

The language requirement (see page 159) must be satisfied.

The program in Public Affairs is offered in two fields of specialization: domestic economics and domestic politics.

Recommended for domestic economics: courses in economic development, economic policy, public finance, and national income.

Recommended for domestic politics: courses in U.S. social, constitutional, and political history; comparative government; political theory; the American Presidency; legislative organization; jurisprudence; political parties; and public opinion.

RUSSIAN STUDIES

Prerequisite: an undergraduate major in a pertinent field. The undergraduate program should have included appropriate courses in history, political science, and Russian language (see page 372).

The student's program of study is planned in consultation with an adviser, and the 24 semester hours of course work (see pages 372–73) include courses in economics, history, political science, and Russian culture or Soviet literature. The student must pass a general written examination, and he must submit a required thesis (equivalent to 6 semester hours) that is interdisciplinary in approach. The language requirement (see page 159) must be satisfied.

Foreign Affairs Intern Program

THE SCHOOL OF PUBLIC AND INTERNATIONAL AFFAIRS in cooperation with the United States Information Agency offers a special Program of graduate studies for selected candidates, leading to the degree of Master of Arts in the field of International Affairs or (with permission) in the field of Public Affairs. The Program is designed to give persons from racial minority groups within the United States the opportunity of entering the Foreign Service and of undertaking careers in the United States Information Agency. It is conducted under a Ford Foundation grant to the University.

The Ford Foundation grant enables the Intern to enroll as a graduate student in the School of Public and International Affairs with full tuition and

other University-related expenses supplied. The salary paid to him by the Information Agency, which will come to approximately \$6,300, should be sufficient to cover the Intern's living and personal expenses.

The Ford grant will also provide such benefits as one round-trip travel fare to the Intern's permanent residence, subscriptions to relevant journals and publications, books on subjects related to public and international affairs, and assistance for obtaining tickets for suitable cultural events.

ADMISSION TO THE PROGRAM

The applicant must have a Bachelor's degree from an accredited college or university, in a discipline related to international affairs. He must also fulfill the requirements established by law for employment in the Information Agency. Persons interested in applying for the Program should take the Foreign Service Information Officer Examination during their final undergraduate year, as a first "trial run." Normally, the Examination is given in December of each year.

PLAN OF STUDY

Interns will be expected to work an average of 20 hours a week with the Information Agency on assignments which will prepare them for Foreign Service careers. In addition to assignments in the various geographic operations offices, they will be exposed to all the functional and operational divisions and areas of the Agency, such as the Voice of America, motion picture and television, press and publications, graphic arts, research, and personnel and training functions of the Agency.

The requirements for the Master's degree are a minimum of 24 semester hours of graduate course work; proficiency in a modern foreign language; the passing of the Master's Comprehensive Examination in three fields which the degree candidate will choose from those offered by the School; and the submission of an acceptable thesis, for which 6 semester hours of credit are granted. To prepare adequately for the Master's Comprehensive Examination, students may be required to take some courses at the undergraduate level.

Generally the Intern will satisfy his course-work requirement at the rate of 9 semester hours a semester. He can elect approved courses at the other member institutions of the Consortium of Universities of the Washington Metropolitan Area, Inc., if such courses are not available at George Washington University.

For further information, write to the Director, Foreign Affairs Intern Program, George Washington University, Washington, D.C. 20006.

Institute for Sino-Soviet Studies

GRADUATE STUDY AND RESEARCH IN COMMUNIST AFFAIRS

THE INSTITUTE FOR SINO-SOVIET STUDIES provides a program of specialized graduate study and research within the School of Public and International Affairs. Courses of the Institute are drawn from a variety of academic areas and thus provide an interdisciplinary approach to the study of the Soviet Union,

Eastern Europe, the Far Eastern Communist states, and the world Communist movement. Faculty members conduct seminars and reading courses in the disciplines of economics, geography, history, language (both linguistics and literature), law, political science and international relations, psychology, and sociology.

The Institute provides Master's and Doctoral candidates with the opportunity to combine a course program of Sino-Soviet Studies with the work in their own disciplines. It also offers a 30-semester hour program of graduate study leading to a Certificate for specialized study on the Soviet Union, China, or both (see page 165).

Students who are preparing for the degree of Master of Arts in the field of International Affairs in the School of Public and International Affairs, or for the degree of Master of Arts in the field of economics, history, or political science in the Graduate School of Arts and Sciences, with a specialization in Sino-Soviet Studies, may take one-half of their course work from the Institute's program.

Students working toward the degree of Doctor of Philosophy in International Relations with special emphasis on the Sino-Soviet Area are expected to combine work in the Institute with work in the fields of economics, history, and political science. Doctoral candidates in the field of political science may combine work in the Institute with work in an appropriate number of fields within political science. All work leading to the degree of Doctor of Philosophy is under the general supervision of the Graduate School of Arts and Sciences and Consultative Committees designated by it which direct the work of each graduate student upon admission to degree candidacy. Doctoral candidates in political science and other disciplines may assume that their committees in consultation with them will arrange for an appropriate combination of fields concerned with Sino-Soviet Studies with work in other phases of their disciplines. A candidate for such a degree should assume that his committee will require the substitution of a reading examination in Chinese or Russian for one of the two Western languages normally required for the degree.

RESEARCH

Research work is integrated with the teaching program. Members of the research program belong to different disciplines and include not only faculty but also selected graduate students. Research monographs are being published by the Institute.

A special brochure describing in more detail the work of the Institute is available upon request.

INTERUNIVERSITY RESEARCH COLLOQUIA

Scholars from The George Washington University, American University, Howard University, the School of Advanced International Studies of Johns Hopkins University, and the University of Maryland conduct two interuniversity research colloquia. The Colloquium on Modern China is under the chairmanship of Professor Franz Michael, Director of the Institute for Sino-Soviet Studies; the Colloquium on Russia and Eastern Europe is under the chairmanship of Professor Andrew Gyorgy. Research in progress undertaken by members of the colloquia and plans for future research are discussed at weekly meetings.

Advanced graduate students can be admitted on approval of the chairman concerned. They receive 3 semester hours of academic credit for each semester of participation.

CERTIFICATE OF THE INSTITUTE FOR SINO-SOVIET STUDIES

The Institute for Sino-Soviet Studies offers a Certificate in Sino-Soviet Studies for students who wish evidence of the completion of specialized studies on the Soviet Union, Eastern Europe, and/or China. Candidates for advanced degrees and qualified nondegree students may apply for the Certificate upon the completion of the requirements set forth below.

ENTRANCE REQUIREMENTS

A Bachelor's degree from an accredited college or university, with a *B* average, or the equivalent, is required.

The applicant's undergraduate program should have included background courses corresponding to an undergraduate major in International Affairs at this University, with emphasis on the Soviet Union and China (see pages 371-72). Any deficiencies in the applicant's study of the Soviet Union and China must be satisfied by appropriate undergraduate courses, as specified by his adviser, in addition to the requirements for the Certificate.

REQUIREMENTS FOR THE CERTIFICATE

The program consists of 30 semester hours of graduate study and the passing of a reading examination in Russian or Chinese, or both. Each program is planned in consultation with the Director of the Institute or one of his associates. Since the Institute places emphasis upon the interdisciplinary approach to study and research, the student can expect his program to include work in economics, geography, history, law, literature and culture, political systems, political theory, and psychology.

Although the student's background and prior study determine to a considerable extent his program in the Institute, intensive research on either country should run concurrently with seminars listed in the annual program of the Institute.

RESIDENCE

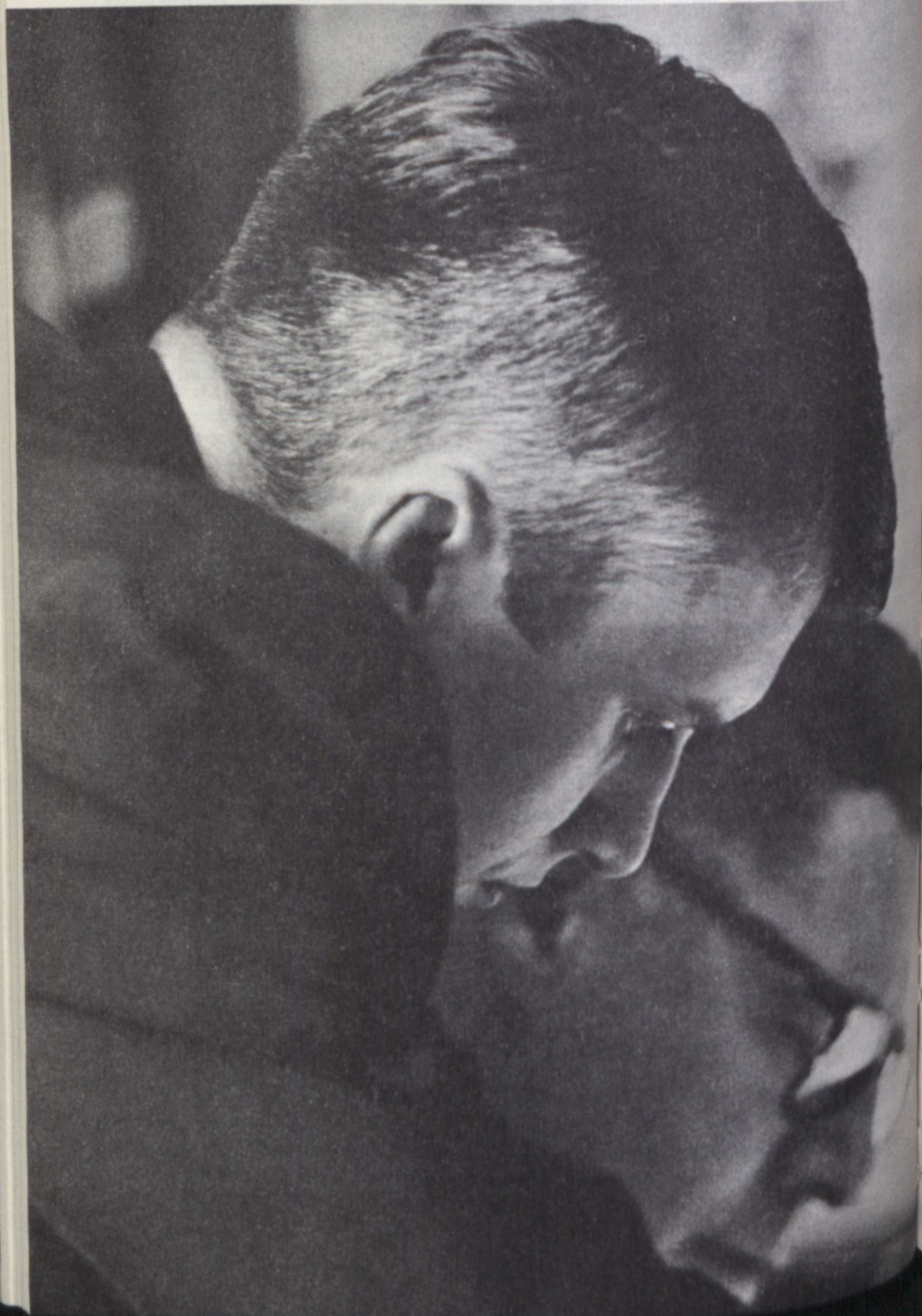
All of the work for the Certificate must be taken in residence in the School of Public and International Affairs, as a candidate for the Certificate; and all of the work must be completed in a maximum of three years, unless an extension of time is granted by the Dean.

War College Programs

THE SCHOOL OF PUBLIC AND INTERNATIONAL AFFAIRS has academic jurisdiction over the off-campus programs at the National and the Naval War Colleges leading to the degree of Master of Science in International Affairs. These pro-

grams are administered by the College of General Studies. Admission is limited to selected members of the faculty and student bodies of the War Colleges.

The programs of study are complementary to the portions of the War College curricula pertaining to international relations, national strategy, and foreign policy.



DIVISION OF UNIVERSITY STUDENTS

Dean J.G. Allee, Jr.
Acting Assistant Dean Jean Gladding

DEAN'S COUNCIL*

J.G. Boswell, A.H. Desmond, Hewitt Kenyon, J.A. Morgan, Jr.

INTRODUCTION

THE DIVISION OF UNIVERSITY STUDENTS was established in 1930 to make the regular course offerings of the University more generally available to members of this metropolitan community and others who are not at the time candidates for degrees in this University. In this Division are registered students who wish to undertake university courses for credit or as auditors. University Students, often employed in government or industry, may be taking courses to increase their vocational fitness or to inform them on new developments in the arts and sciences. They may be taking courses as a matter of personal interest for cultural enrichment. Such students may be candidates for higher degrees in other institutions, sent here for special work as part of a graduate program. They may be undergraduates, matriculated in other colleges, taking summer sessions courses only or courses for transfer during the regular academic year with the approval of their own institution. To serve members of such groups and others not enrolled in degree-granting branches of the University is the function of the Division of University Students.

The privilege of attending George Washington University as a nondegree student is granted on the basis of maturity and proper preparation. Because no degree at George Washington University is involved, there can be no meaningful advisory system in the Division. However, students are invited to seek advice from academic departments. University students are urged to apply to the Office of Admissions for transfer to degree-granting branches whenever such action is appropriate.

All courses except those restricted to medical and law students and those limited to specific degree candidates are open to students in the Division of University Students. Students wishing to take Engineering and Applied Science courses, see the *School of Engineering and Applied Science Catalogue*.

Registration in a given course may be denied students in this Division when space is needed for degree candidates.

An applicant who has been denied admission to any degree-granting branch of the University will not be considered for admission to the Division of University Students for the semester for which the applicant was denied. Such an applicant may be considered in subsequent semesters.

*The Vice President for Academic Affairs, the Dean and the Acting Assistant Dean of the Division are ex officio members of the Council.

ENTRANCE REQUIREMENTS*

Good character and an academic background appropriate for the program of studies contemplated are required.

A person not working for a degree at this University will be considered for admission to the Division of University Students to take courses for which he has adequate preparation, as determined by the departments concerned.

Scholastic records are required of

1. An applicant who graduated from high school within the previous two calendar years. Such an applicant must meet the following requirements, which are the same as those for admission to Columbian College of Arts and Sciences.
 - a) An acceptable certificate of graduation from an accredited secondary school, showing at least fifteen units† which must include four years of English; at least two years of one foreign language; two years of science, preferably with laboratory instruction; two years of social studies, one of which must be American history; and two years of college preparatory mathematics. It is to be noted that one unit of algebra, or the equivalent, is prerequisite to courses in chemistry and statistics, and that one unit in algebra and one unit in plane geometry, or the equivalent, are prerequisite to courses in mathematics and physics.
 - b) The principal's statement that the applicant is prepared to undertake college work.
 - c) College Entrance Examination Board scores must be submitted on the Scholastic Aptitude Test and the English Composition Achievement Test.
2. An applicant who has been subject to any form of academic or disciplinary action at any college or university within the previous calendar year.
3. High school students who are applying for the Secondary School Honors Program, see page 170.

Scholastic records may be required of

1. An applicant who has attended any college or university during the previous calendar year.
2. A former student of this University who was on probation or suspended and, since then, has attended another college or university.
3. An applicant who has ever been subject to academic or disciplinary action. When scholastic records are required, a student may be admitted for one semester or summer term only, pending receipt of records and under provisions stated by the Office of Admissions.

REGULATIONS

Regulations concerning ADMISSION, REGISTRATION, FEES AND FINANCES are stated on pages 23-33; other University regulations, on pages 43-51.

Prospective and registered students are urged to acquaint themselves with the regulations concerning "Attendance," see page 44, and "Withdrawal," see page 46.

* Foreign students, see pages 26-27.

† A unit represents a year's study in a secondary school subject, including in the aggregate not less than 120 sixty-minute periods, or the equivalent, of prepared classroom work.

ACADEMIC WORK LOAD

A full-time student who is not on probation may take ordinarily not more than 17 semester hours. A student employed more than 20 hours a week, who is not on probation, may take not more than 10 hours.

A full-time student whose quality-point index is the equivalent of 3.50 or higher may take not more than 19 hours. An employed student who meets the same standard may take not more than 12 hours.

A student who accepts employment after registration or at any time during a semester must report that fact immediately to the Dean so that his program may be adjusted, if necessary.

SCHOLARSHIP

A student who fails to maintain the scholarship requirements of this Division may be dismissed from the University.

GRADES

Undergraduate.—See page 44.

Graduate.—For graduate work, grades are indicated as *A*, excellent; *B*, good; *C*, minimum pass; *F*, fail; *I*, incomplete; *W*, authorized withdrawal; *CR*, credit.

PROBATION AND SUSPENSION

A student taking only first- and second-group courses must maintain a quality-point index of 2.00, or the equivalent, or be placed on probation. He remains on probation as long as his cumulative record is below the required standard. If his record indicates an index of 1.50, or the equivalent, he is subject to suspension.

A student who has a Bachelor's degree, or its equivalent, or who has taken any third- or higher-group course must maintain a quality-point index of 2.00, or the equivalent, in all first-group courses, and 3.00, or the equivalent, in all higher-group courses, or be placed on probation. He remains on probation as long as his cumulative record indicates an index below 2.00, or the equivalent, in first-group courses, and/or indicates an index below 3.00, or the equivalent, in higher-group courses. If his record indicates an index below 1.50, or the equivalent, in first-group courses, or if his record indicates an index below 2.25, or the equivalent, in higher-group courses, he is subject to suspension. The exception to the above will be that whenever the cumulative index or record (combined index or record of courses of all groups) is raised to 3.00, or the equivalent, by grades achieved in higher-group courses the student will not be placed on probation; however, the index, or the equivalent record, achieved in first-group courses cannot offset the index or the equivalent record of the higher-group courses.

CHANGES IN PROGRAM OF STUDIES

Changes within the Division of University Students.—A student may not change or drop courses (see "Withdrawal," page 46) or change his status to that of auditor except with the approval of the Dean.

Change from one section to another of the same course may be made with the approval of the Dean and the department concerned.

Transfer within the University.—Transfer to or from the Division of University Students may be made only with the approval of the deans concerned.

Application for transfer to degree candidacy will be considered only after the completion of at least one semester in the Division of University Students.

The student currently or previously registered in this Division who wishes transfer to degree candidacy should understand that consideration will be given to only those courses which are approved as applicable toward the degree sought and that a maximum of 45 semester hours of such credits earned in this Division can be applied toward a Bachelor's degree. Upon transfer the student should consult the dean concerned and understand clearly the requirements he must fulfill.

Normally, all work toward a Master's degree must be done in residence in the degree-granting college or school. A student planning to do graduate work in the School of Education, the School of Engineering and Applied Science, the School of Government and Business Administration, or the School of Public and International Affairs should consult with the relevant degree-granting school in order to comply with the pertinent regulations concerning transfer.

A student who is enrolled in the Division of University Students or is entering that Division, and expects to transfer credit for course work toward a degree in the Graduate School of Arts and Sciences, *must* have the written approval of the department concerned and the Graduate School of Arts and Sciences prior to the completion and transfer of such credits.

SECONDARY SCHOOL HONORS PROGRAM

The outstanding secondary school student in the Washington metropolitan area who wishes to enrich his academic background and participate in stimulating college work is encouraged to seek admission to the George Washington University's Secondary School Honors Program. The Honors Student is enrolled in regular college courses of his own choosing appropriate to his level of study, his background, and his aptitude as determined through consultation with his high school counselors and advisers at the University.

Credit earned in the Program is applicable toward a degree at George Washington University should the student later matriculate here. The transfer of credit elsewhere depends upon the policies of the individual schools to which the student might later apply.

Admission to the Honors Program is highly competitive. Only 15 students a semester will be admitted in this Program, but each student will receive a scholarship totaling 50 per cent of his tuition (excluding laboratory fees). Admission is for one semester only, but students doing well will be given preference for continuation and may be readmitted for a second semester. Criteria for admission include a transcript of the student's grades to date, available test scores, evidence of emotional and intellectual maturity, and the results of the interview with the Director.

Application forms and further information may be obtained from Miss Jean M. Gladding, Director of the Secondary School Honors Program, Division of University Students, George Washington University, Washington, D.C. 20006. No applications will be considered after September 1 for the fall semester or January 1 for the spring semester. For application for the summer session see the *Summer Sessions Catalogue*.

THE SUMMER SESSIONS

Dean C.W. Cole

Assistant Dean Lawrence Winkler

The Program news-report, *STUDENT INFORMATION*, which includes a bibliography, special reports, and university representation, is published in the fall. Funding sources for the Program of Policy Studies include the University; a basic institutional grant from NASA; and grants and contracts from other agencies such as the Department of Health, Education, and Welfare (Office of Education); the Department of Commerce (National Bureau of Standards); the Department of State (Arms Control and Disarmament Agency); the Department of Justice (National Institute of Law Enforcement and Criminal Justice); and the Bartlett Memorial Institute.

STAFF

Director of the Program: Louis H. Mayo, Vice President for Advanced Policy

DURING THE SUMMER OF 1970, Columbian College of Arts and Sciences, the Graduate School of Arts and Sciences, the School of Engineering and Applied Science, the School of Government and Business Administration, the School of Public and International Affairs, and the Division of University Students offer courses in two 5-week sessions. The School of Engineering and Applied Science also offers courses in an 8-week period. The National Law Center offers courses in two 6-week sessions and one 13-week session; the School of Education offers courses in a 6-week session and three 3-week workshop sessions. In addition, a carefully planned group of special programs will be offered on campus to serve a variety of student needs.

For a complete statement concerning summer-term work, see the *Summer Sessions Catalogue*.



PROGRAM OF POLICY STUDIES IN SCIENCE AND TECHNOLOGY

Director L.H. Mayo

THE PRIMARY OBJECTIVE of the Program of Policy Studies in Science and Technology is to encourage the continuing development of a University policy research capability directed toward the complex issues confronting society. As an integral part of the University, the Program undertakes to serve as an organizing element and to provide a neutral forum for the discussion of policy issues—current and prospective—by representative community groups, and as an advisory and research resource for policy makers in both public and private sectors.

Activities of the Program reflect a number of ways in which a wide range of interdisciplinary talents can be brought to bear upon the analysis of policy problems, particularly those involving the impact of advancing technology on the processes, values, and institutions of society.

By means of the Program of Policy Studies in Science and Technology, George Washington University is moving toward an institutional approach to the policy analysis function as contrasted with the highly fragmented and largely uncoordinated pattern of "institutes," "centers," and "study groups" which exists at most universities. The Program of Policy Studies concept is novel in its attempt to provide an organization that strengthens the University's ability to address itself to broad issues of public policy. This approach envisages a continuing interaction among the professional staffs of the Program of Policy Studies in Science and Technology, other policy research groups, and other faculty members of the schools and departments of the University.

The following are the primary study areas around which the Program's activities have focused:

1. The structure and functions of institutions designed to stimulate, utilize, regulate, and appraise the application of science and technology to the achievement of basic community goals, and to society's needs, national and international.

2. The application of modern Research and Development management concepts and skills to the planning, programming, and managing of governmental programs and urban social problem areas.

The Program has also undertaken to bring into focus the courses and seminars offered by the University which are directly related to the interface area of science, society, and public policy. An announcement is published every Fall.

The Program supports or conducts a number of activities, including studies, monographs, special reports, and professional seminars with government, industry, policy research, and university representatives. An Annual Report of current activities is published in the Fall.

Funding sources for the Program of Policy Studies in Science and Technology include the University; a basic institutional grant from NASA; and grants and contracts from other agencies such as the Department of Health, Education, and Welfare (Office of Education); the Department of Commerce (National Bureau of Standards); the Department of State (Arms Control and Disarmament Agency); the Department of Justice (National Institute of Law Enforcement and Criminal Justice); and the Battelle Memorial Institute.

STAFF*

- Director of the Program: Louis H. Mayo, *Vice President for Advanced Policy Studies; Professor of Law*
 Guy Black, *Senior Staff Scientist; Associate Professor of Business Economics*
 James M. Brown, *Coordinator, Urban Problems Seminar Series; Professor of Law*
 Thomas Burns, *Senior Staff Scientist, Behavioral/Systems Research Project; Associate Professor of Sociology, University of New Hampshire*
 Robert L. Chartrand, *Program Associate; Information Sciences Specialist, Library of Congress*
 Vary T. Coates, *Research Scientist (Public Affairs)*
 Clarence H. Danhof, *Senior Staff Scientist (Economics)*
 Richard F. Ericson, *Senior Staff Scientist; Director, Interdisciplinary Systems and Cybernetics Project; Professor of Management*
 Harold P. Green, *Professor of Law; Director, Law, Science, and Technology Program*
 Stuart Greenberg, *Research Associate*
 John Hanessian, Jr., *Senior Staff Scientist, Director, International Studies Group; Associate Professorial Lecturer in Political Science*
 Kathryn L. Hensley, *Research Associate, Educational Policy Group*
 Guenther Hintze, *Research Professor of Electrical Engineering*
 Mary A. Holman, *Associate Professor of Economics*
 William H. Kallon, *Research Associate*
 Raphael G. Kasper, *Research Scientist (Nuclear Engineering)*
 Norma Katelvero, *Research Associate*
 John M. Logsdon, *Research Scientist; Assistant Professor of Public Affairs and Political Science*
 James E. Mahoney, *Senior Staff Scientist (Organization/Management)*
 Joseph B. Margolin, *Senior Staff Scientist; Director, Educational Policy Group; Associate Professorial Lecturer in Psychology*
 William H. Marlow, *Director, Institute for Management Science and Engineering; Professor of Applied Science*
 E. David Marwick, *Research Associate, Behavioral Systems Research Project*
 Phyllis McDonald, *Research Scientist, Educational Policy Group*
 Mary Elizabeth McIlvane, *Research Associate, Educational Policy Group*

* Staff listing consists of members who allocate all or a substantial portion of their effort to Program activities. Directors and members of the staffs of other policy study groups in the University also participate in the various seminar series, conferences, and other activities of the Program.

Arthur S. Miller, *Professor of Law*

Marion R. Misch, *Research Scientist, Educational Policy Group*

Ellis R. Mottur, *Senior Staff Scientist; Director, Technological Innovation Policy Project*

Bernard A. Schriever, *Senior Staff Scientist; Vice Chairman of the Advisory Committee*

Nozer D. Singpurwalla, *Associate Professor of Applied Science*

Joseph L. Tropea, *Director, Behavioral/Systems Research Project; Assistant Professor of Sociology*

Isolde Weinberg, *Research Associate, Educational Policy Group*

ADVISORY COMMITTEE

Chairman: Lloyd H. Elliott, *President, George Washington University*

Vice Chairman: Bernard A. Schriever, *Chairman of the Board, Schriever & McKee Associates, Inc., Arlington, Va.*

Raymond L. Bisplinghoff, *Dean, School of Engineering, Massachusetts Institute of Technology*

Harold F. Bright, *Provost and Vice President for Academic Affairs, George Washington University*

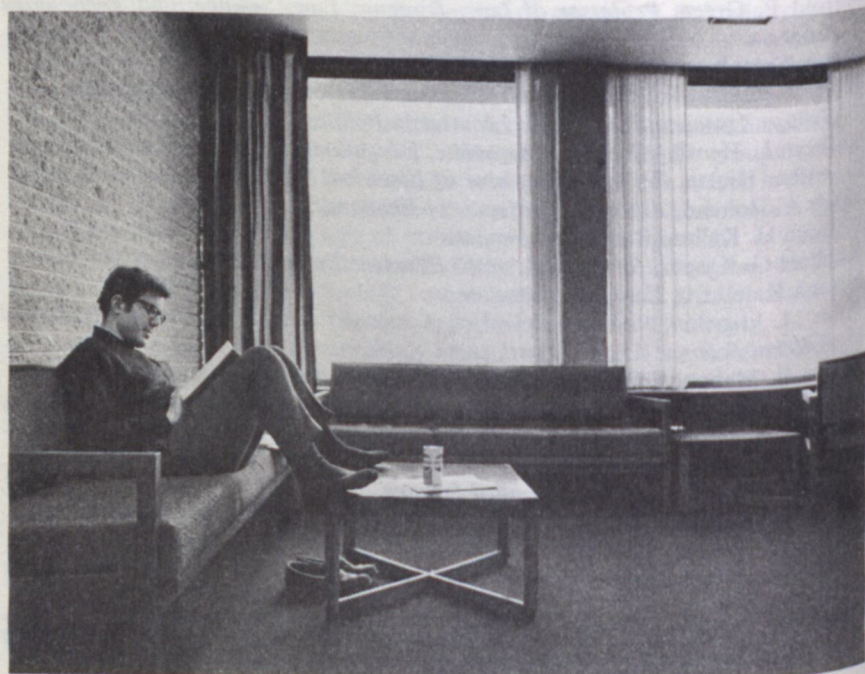
Arthur E. Burns, *Dean, Graduate School of Arts and Sciences, George Washington University*

Joseph L. Fisher, *President, Resources for the Future, Inc., Washington, D.C.*

Lawrence Levy, *President, Allied Research Associates, Concord, Mass.*

Dwight Waldo, *Albert Schweitzer Professor in the Humanities, Syracuse University*

Reuben E. Wood, *Professor of Chemistry, George Washington University*



SPONSORED RESEARCH

Assistant Vice President for Research C.J. Lange

THE RESEARCH PROGRAMS listed in this section are special programs which are established for the specific purpose of attacking in an academic atmosphere problems proposed by the individual projects or submitted by the sponsoring agency. Cooperation between these programs and the various departments of instruction is as close as the nature and needs of the programs and departments will permit.

BIOMETRIC LABORATORY

The Biometric Laboratory applies statistical techniques to pharmacological problems related to mental health. It was established under a contract with the National Institutes of Health. The laboratory assists investigators throughout the United States in planning research and in analyzing data. The majority of these research projects concern the effects of drugs on behavior.

Roland R. Bonato, Ph.D., *Director; Associate Research Professor of Psychology*
James J. McKeon, Ph.D., *Assistant Director*
William Guy, Ph.D., *Senior Staff Scientist*
Richard W. Switalski, M.S., *Senior Scientist*
Anne K. Parkin, *Research Scientist*
Arden Smith, B.S., *Research Scientist*
Patricia Cleary, M.S., *Research Associate*
David L. Odle, B.A., *Research Associate*

CENTER FOR MANPOWER POLICY STUDIES

The Center for Manpower Policy Studies is devoted to the evaluation of federally-supported manpower, antipoverty, and related programs. The Center is financed by a grant from the Ford Foundation and offers in conjunction with the Department of Economics graduate courses in labor economics and manpower policy.

Sar A. Levitan, Ph.D., *Director; Research Professor of Economics*
Garth L. Mangum, Ph.D., *Research Professor of Economics*
Barbara J. Hetrick, B.A., *Research Associate*
E. David Marwick, B.A., *Research Associate*
Robert Taggart III, B.A., *Research Associate*

EDUCATIONAL RESOURCES INFORMATION CENTER (ERIC) CLEARINGHOUSE ON HIGHER EDUCATION

The Educational Resources Information Center (ERIC) Clearinghouse on Higher Education was established in the Fall of 1968 with the support of the U.S. Office of Education; it is the nineteenth in a national network of education information centers. The Clearinghouse is responsible for the acquisition, evaluation, abstracting, indexing, and dissemination of research reports and other documents dealing with problems and issues in the field of higher education.

Carl James Lange, Ph.D., *Director; Adjunct Associate Professor of Psychology*
 Nancy Lewinsohn, Ph.D., *Associate Director*
 Wilma D. Monlouis, B.Mus.Ed., *Research Associate*
 Janet D. Shoenfeld, B.A., *Research Associate*
 Carol H. Shulman, M.A., *Research Associate*
 David E. Summer, B.A., *Research Associate*

INSTITUTE FOR MANAGEMENT SCIENCE AND ENGINEERING

The Institute for Management Science and Engineering provides a multidisciplinary environment for innovative graduate teaching and substantial opportunities for research activities and public service under diversified sources of external support.

The Institute works closely with the University's Program of Policy Studies in Science and Technology in the application of developing technologies to contemporary problem areas. Through its Program in Logistics, the Institute performs research leading to the development of a science in logistics featuring principles and methodology for resource allocation problems in civil affairs and national defense efforts.

William H. Marlow, Ph.D., *Director; Professor of Applied Science*
 William E. Caves, *Senior Staff Scientist*
 Joseph P. Fennell, M.A., *Senior Staff Scientist*
 Sheldon E. Haber, Ph.D., *Associate Professor of Economics*
 James E. Hamilton, M.S., *Senior Scientist*
 Guenther Hintze, M.S., *Research Professor of Electrical Engineering*
 Raymond W. Lewis, B.A., *Senior Scientist*
 Arthur J. Nevins, Ph.D., *Senior Staff Scientist*
 Erling F. Rosholdt, M.E.A., *Senior Staff Scientist*
 Frank W. Segel, M.B.A., *Senior Staff Scientist*
 Nozer D. Singpurwalla, Ph.D., *Associate Professor of Applied Science*
 Henry Solomon, Ph.D., *Professor of Economics*
 Ross E. Tomlinson, M.A., *Senior Staff Scientist*
 William L. Wilkinson, M.S., *Senior Staff Scientist*

MID-ATLANTIC REGION SPECIAL EDUCATION INSTRUCTIONAL MATERIALS CENTER

The Mid-Atlantic Region Special Education Instructional Materials Center (MAR-SEIMC) was established in March, 1967, by the Bureau for Education of the Handicapped, U.S. Office of Education, and George Washington Univer-

sity to collect, organize, disseminate, and develop information and materials about and for the instruction of handicapped children and youth. Providing assistance in the development of similar centers throughout the Mid-Atlantic Region (Delaware, the District of Columbia, Maryland, New Jersey, Pennsylvania, and Virginia) is a major activity. Related evaluation and research activities are undertaken, and workshops are conducted both in the Center and in the field. MAR-SEIMC is part of a national network of similar centers.

Raymond S. Cottrell, Jr., Ed.D., *Director; Associate Professor of Special Education*

Janice M. Rhone, M.S., *Assistant to the Director*

Richard A. Lallmang, M.S., *Senior Scientist*

Carol Gross, M.A., *Research Scientist*

Gerald D. Bravi, M.S. in Ed., M.A. in Ed., *Research Associate; Lecturer in Special Education*

Georgia Davis, B.A., *Research Associate*

Donald F. Hall, Ed.S., *Research Associate; Lecturer in Special Education*

Grace Leahey, *Research Associate*

Kathryn Werlin, M.S., *Research Associate*

NATURAL RESOURCES POLICY CENTER

The Natural Resources Policy Center was established in September, 1965, to develop and undertake activities facilitating graduate education, to train employees of public resources agencies, and to sponsor professional research in the area of natural resources. The program of the Center focuses particularly on increasing the contribution of the social sciences—economics, planning, and the political institutions of natural resources agencies—so that these disciplines and related fields of knowledge may be brought to bear more fruitfully on contemporary problems relating to the management and development of natural resources. The Center is administratively associated with the Department of Economics and, in its research program and in the design of courses in that Department and several others, provides a focus on natural resource problems and issues.

Jack L. Knetsch, Ph.D., *Director; Professor of Economics*

OPERATIONAL AND DEMOGRAPHIC ANALYSIS FOR MATERNAL AND CHILD HEALTH CARE PROJECT

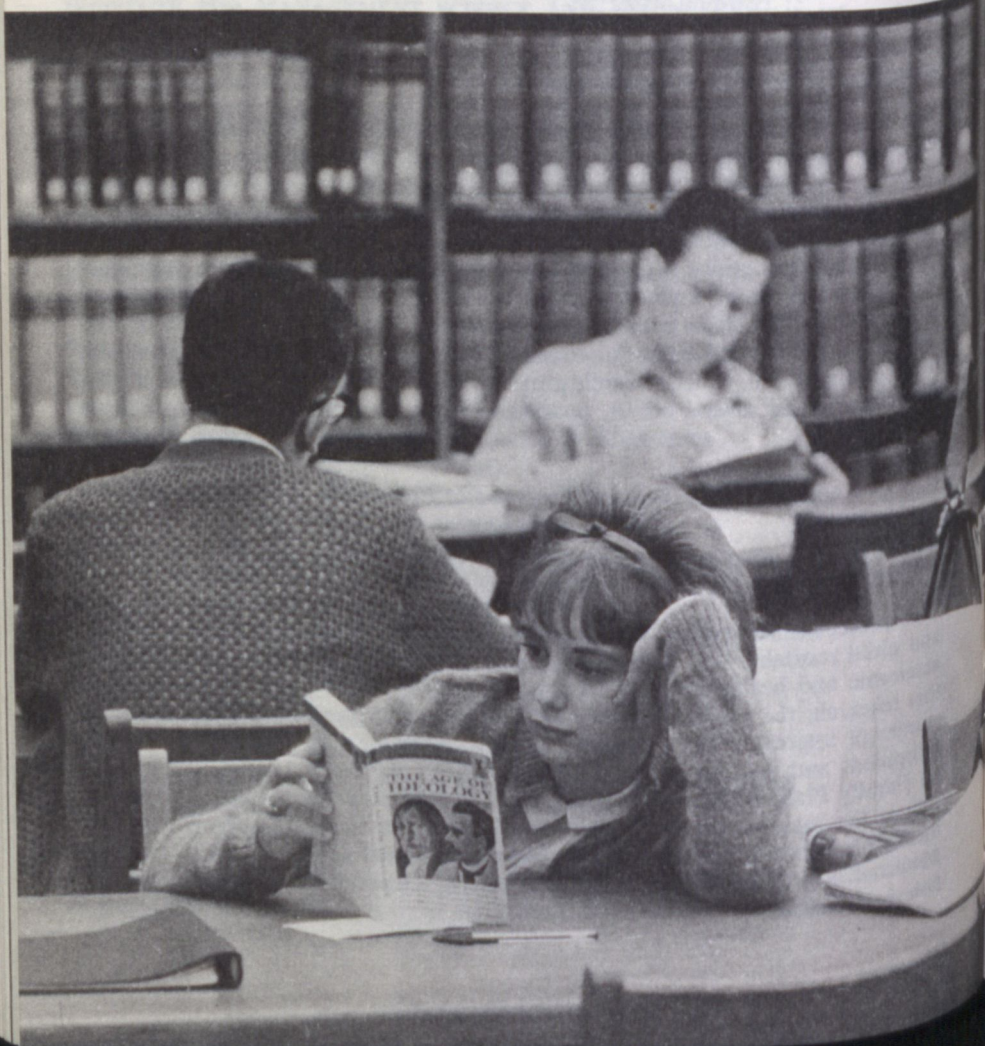
This project is concerned with computer-supported research into the maternal and child mortality and prematurity levels of the United States and the socioeconomic and health facilities factors which affect those levels. In addition to this research, the project designs and implements informational and evaluative studies of interest to the sponsoring agency. A major activity has been the development and field testing of the Government's Provisional Reporting System on Family Planning Services. The project is now concerned with an investigation of the basic structure and standards essential to Health Programs Management Information Systems. This project is operated under a grant from the Maternal and Child Health Service, HSMHA, Department of Health, Education, and Welfare.

Roland R. Bonato, Ph.D., *Director; Associate Research Professor of Psychology*
Margaret W. Pratt, B.A., *Assistant Director*
Gerald L. Giesecke, B.S., *Senior Scientist*

SOCIAL RESEARCH GROUP

The Social Research Group conducts surveys and experiments with concentration on basic research underlying an approach to the solution of social problems.

Ira H. Cisin, Ph.D., *Director; Professor of Sociology*
Hugh J. Parry, Ph.D., *Associate Director; Research Professor of Sociology*
Don Cahalan, Ph.D., *Senior Staff Scientist*
Ben L. Owens, *Senior Staff Scientist*
Regis H. Walther, Ph.D., *Senior Staff Scientist*
Clinton A. Neyman, M.A., *Senior Research Scientist*
Elaine F. Hayden, Ph.D., *Senior Scientist*
Robert F. Hess, *Senior Scientist*
Robin Room, M.A., *Research Scientist*



COURSES OF INSTRUCTION

ON THE FOLLOWING PAGES OF THIS CATALOGUE, under the alphabetically arranged names of the departments of instruction and special interdepartmental programs, are listed the courses of instruction offered by the University in the academic year 1970-71. The courses as here listed are subject to change. The University reserves the right to withdraw any course announced.

HOURS OF INSTRUCTION

Classes are scheduled in the morning, afternoon, and evening. Evening and daytime sections of the same course are identical, are taught by the same staff of instructors, and carry the same amount of credit. By taking the evening and summer classes and extending the time of study beyond the usual four years, a part-time student may complete the requirements and obtain a degree.

EXPLANATION OF COURSE NUMBERS

First-group courses.—Courses numbered from 1 to 100 are planned for students in the freshman and sophomore years. With the approval of the adviser and the Dean, they may also be taken by juniors and seniors. In certain instances, they may be taken by graduate students to make up undergraduate deficiencies or as prerequisite to advanced courses, but they may not be taken for graduate credit.

Second-group courses.—Courses numbered from 101 to 200 are planned for students in the junior and senior years. They may be taken for graduate credit only upon the approval of the dean and the instructor at the time of registration. Such approval is granted only with the provision that students must complete additional work in order to receive graduate credit.

Third-group courses.—Courses numbered from 201 to 300 (in the Graduate School of Arts and Sciences, the School of Government and Business Administration, and the School of Public and International Affairs); courses numbered 201 to 400 (in the School of Education) are planned primarily for graduate students. They are open, with the approval of the instructor, to qualified seniors; they are not open to other undergraduates. Qualified seniors in the School of Government and Business Administration registering for these courses must have a 3.00 average, the prior approval of the department chairman who is responsible for the graduate course, and the prior approval of the Dean.

Fourth-group courses.—Courses numbered 301 to 400 in the Graduate School of Arts and Sciences are limited to graduate students; but they are primarily for doctoral candidates. Courses numbered 301 to 400 in the School of Government and Business Administration are limited to doctoral students. In the School of Education fourth-group courses, numbered 401 to 500, are limited to graduate students with Master's degrees from accredited institutions.

KEY TO ABBREVIATIONS

The following abbreviations are used in this catalogue for course designations.

Acct	Accounting	HonP	Honors Program—Columbian College Lower Division
AmCv	American Civilization	Ital	Italian
Anat	Anatomy	Jour	Journalism
Anth	Anthropology	Mgt	Management Science
Bioc	Biochemistry	Math	Mathematics
B Sc	Biological Sciences	Micr	Microbiology
B Ad	Business Administration	Mus	Music
Chem	Chemistry	Path	Pathology
Chin	Chinese Language and Literature	Phar	Pharmacology
Clas	Classics	Phil	Philosophy
Econ	Economics	PE	Physical Education
Educ	Education	Phys	Physics
EE	Electrical Engineering	Phyl	Physiology
Engl	English	P Sc	Political Science
Epid	Epidemiology and Environmental Health	Psyc	Psychology
Hum	Experimental Humanities	P Ad	Public Administration
Fren	French	Rel	Religion
Gnet	Genetics	Slav	Slavic Languages and Literatures
Geog	Geography and Regional Science	Soc	Sociology
Geol	Geology	Span	Spanish
Germ	Germanic Languages and Literatures	S Ed	Special Education
HCA	Health Care Administration	Sp&D	Speech and Drama
Hist	History	Stat	Statistics
		U&RP	Urban and Regional Planning

SEMESTER HOURS OF CREDIT

The number of semester hours of credit given for the satisfactory completion of a course is, in most cases, indicated in parentheses after the name of the course. Thus, a year course giving 3 hours of credit each semester is marked (3-3), and a semester course giving 3 hours of credit is marked (3). A semester hour usually consists of the completion of one fifty-minute period of class work or of one laboratory period a week for one semester.

TIME OF COURSE OFFERINGS

Following most course descriptions is a parenthetical statement listing the time (day or evening) and the semester (fall or spring) for which the course is scheduled for 1970-71. The term "academic year" is used only with two-semester courses, and indicates that the first half of the course is to be offered in the fall semester and the second half in the spring semester. If no parenthet-

ical statement appears, the course is not scheduled to be offered during the fall or spring semesters of 1970-71. Offerings for the summer sessions are not designated in this catalogue. Students should consult the *Summer Sessions Catalogue* or *Schedule of Classes* for summer offerings. A *Schedule of Classes* is also published for each fall and spring semester which provides more exact and up-to-date information concerning the time of course offerings.

Accounting

Professor E.J.B. Lewis (*Chairman*)

Professorial Lecturers M.P. Pujol, A.L. Litke, Daniel Borth

Associate Professors F.C. Kurtz, Chei-Min Paik, A.J. Mastro, C.D. Hughes, M.G. Gallagher

Associate Professorial Lecturer Raymond Einhorn

Assistant Professor J.L. Thompson, Jr.

Assistant Professorial Lecturers R.W. Perkins, E.M. Wysong, Jr., E.J. Shuchart,

Nathan Cutler, John Croxall

Lecturer T.E. Richards

Programs of study in Accounting leading to the degrees of *Bachelor of Business Administration* and *Master of Business Administration* are offered by the School of Government and Business Administration (see pages 127-52). The terminal curriculum in Accounting leading to the degree of *Associate in Arts* is offered by Columbian College of Arts and Sciences (see pages 82-83).

FIRST GROUP

1-2 Introductory Accounting (3-3)

Staff

Preparation, uses, and limitations of financial reports. Acct 1: basic financial reporting concepts and data accumulation and processing. Acct 2: introduction to managerial accounting—financial programming, cost determination, and analysis of financial statements. Acct 1 is prerequisite to Acct 2. (Acct 1 and 2: fall and spring—day and evening)

SECOND GROUP

101 Cost Accounting (3)

Hughes

Theory and purposes of industrial cost accounting, systems of cost control and determination, analysis and interpretation of cost data. Prerequisite: Acct 1-2. (Fall—evening; spring—day)

111 Financial Statement Analysis (3)

Litke

Methods and techniques of preparing, analyzing, and interpreting financial statements for the guidance of operating executives, directors, stockholders, and creditors. Prerequisite: 6 semester hours of accounting or permission of instructor. (Spring—evening)

115 Survey of Accounting (3)

Gallagher, Thompson

Preparation, uses, and limitations of financial information in the management process. Not open for credit to accounting majors. (Fall—day and evening; spring—evening)

121-22 Intermediate Accounting (3-3)

Kurtz, Mastro

Acct 121: accounting for assets and liabilities. Prerequisite: Acct 1-2 or permission of instructor. Acct 122: partnership, corporation, consignment, and installment-sales accounting. Prerequisite: Acct 121 or permission of instructor. (Acct 121: fall—day; spring—evening. Acct 122: fall—evening; spring—day.)

132 Accounting Theory (3)

Mastro

Development of basic accounting principles and concepts, review of current thought as reflected in the pronouncements of leading professional and accounting research associations, major contributions to accounting literature. Prerequisite: 6 semester hours of accounting. (Spring—evening)

141 Governmental Accounting (3)

Lewis, Pujol

Appropriation, encumbrance, and fund accounting for governmental and institutional entities. Prerequisite: Acct 1-2 or permission of instructor. (Fall—evening)

144 Federal Accounting (3)

Lewis, Pujol

Accounting procedures in the Federal Government, with emphasis on agency-level accounts and accounting support for cost-based budgets. Prerequisite: Acct 141 or permission of instructor. (Spring—evening)

161 Federal Income Taxation (3)

Gallagher

Federal income tax concepts applicable to individuals and corporations, differences between tax accounting and financial accounting. Prerequisite: Acct 1-2 or permission of instructor (Fall—day; spring—evening)

162 Tax Research and Planning (3)

Gallagher

Survey of substantive federal tax provisions relating to corporations, partnerships, security transactions, estates, gifts, and pension and profit-sharing plans; emphasis on tax research and tax-planning objectives.

171 Auditing (3)

Kurtz, Cutler

Duties and responsibilities of auditors: principles and procedures of making audits, techniques of verifying financial-statement items, preparation of audit working papers and reports. Prerequisite: Acct 121-22. (Fall—evening)

172 Audit Planning and Control (3)

Kurtz

Standards of audit reporting and other current auditing topics, including application of statistical sampling techniques to auditing, auditing electronic systems, and management advisory services. Prerequisite: Acct 171 or permission of instructor. (Spring—evening)

181 Accounting Systems (3)

Lewis, Hughes

Theory and procedure of designing and installing systems for collecting, recording, analyzing, and presenting accounting and other business data. Prerequisite: Acct 101, 121-22, and 171; or permission of instructor.

191 Advanced Accounting (3)

Litke

Consolidated statements, statement of affairs, realization and liquidation reports, and estate and trust accounting. Prerequisite: Acct 121-22. (Fall—evening)

193 Business Budgeting (3) Lewis, Paik

Principles, techniques, and procedures involved in the development, installation, and operation of a system of budgetary control to aid in management of commercial and industrial organizations. Prerequisite: Acct 1-2. (Fall—day; spring—evening)

196 Management Decisions and Accounting (3) Hughes

Analysis of information required in capital budgeting, inventory management, and other decisions; cash-flow and probability data; advanced cost accounting systems. Prerequisite: Acct 101.

THIRD GROUP**215 Survey of Managerial Accounting (3) Hughes, Gallagher**

Nature, preparation, analysis, and interpretation of accounting reports; cost accounting, business budgeting, and internal accounting controls and their use in the management process. Not open for credit to accounting majors. Prerequisite: Acct 1-2 or 115. (Fall and spring—evening)

231 Contemporary Accounting Theory (3) Mastro

Advanced accounting principles and concepts and recent theories concerned with the valuation and amortization of assets and determination of income. Prerequisite: 6 semester hours of accounting and permission of instructor. (Spring—evening)

241 Accounting and Related Disciplines (3) Paik

Relationship between accounting and such related disciplines as economics, statistical theory, and operations research; emphasis on what the accountant has to offer to these allied fields and on new ideas and requirements these fields may offer or impose upon accounting. Prerequisite: 6 semester hours of accounting. (Fall—evening)

245 Decision Systems and Accounting (3) Paik

Limited to students in the Navy Graduate Financial Management Program. Problems encountered in managing financial and related information systems in complex organizations; the relationships between accounting in its broadest sense and management control and decision systems. (Fall)

246 Governmental Accounting and Budgeting Problems (3) Lewis, Borth

Current problems in federal financial planning, programming, budgeting, accounting, and auditing. Prerequisite: Acct 144 or permission of instructor.

275 Internal Control and Auditing (3) Mastro, Wysong

Internal accounting control and review and appraisal of accounting systems, procedures, and managerial policies with respect to their effectiveness and profitability. Prerequisite: Acct 171 or permission of instructor. (Fall—evening)

276 Management Planning and Control (3) Paik

Theories and techniques of cost accounting and budgetary planning and control, with emphasis on: the relation of planning and control systems to corporate and departmental objectives; control of decentralized operations and discretionary costs; long-range planning and control. Prerequisite:

Acct 101 and B Ad 102 or Mgt 201, or permission of instructor.
(Spring—evening)

292 Professional Accounting Review (3)

Lewis

Review and coordination of principles and techniques developed in the accounting curriculum, in preparation for general practice in the field of accountancy and for professional accounting examinations. Prerequisite: Acct 101, 141, 161, 171, and 191; or permission of instructor. (Spring—evening)

295 Seminar in Accounting (3)

Borth

Selected accounting research topics and problems; individual oral and written reports. Admission by permission of instructor; may be repeated once for credit. (Fall—evening)

297 Accounting Reading and Research (3)

Staff

May be repeated once for credit. (Fall and spring)

299 Thesis Seminar (3)

Staff

(Fall and spring)

300 Thesis Research (3)

Staff

(Fall and spring)

American Studies Program

Professor R.H. Walker, Jr. (Director)

Associate Professor C.C. Mondale

Assistant Professors H.F. Gillette, Jr., B.M. Mergen

FACULTY ADVISORY COMMITTEE

R.H. Walker (*Chairman*), C.W. Cole, C.E. Galbreath, F.S. Grubar, H.L. LeBlanc, C.H. Pfuntner, R.P. Sharkey, R.W. Stephens, Dewey Wallace, Jr.

AMERICAN STUDIES COUNCIL—1969-70

The Council serves the American Studies Program in an advisory capacity from several points of view, as follows:

From the Washington Community

Aaron Goldman, *President, Macke Vending Co.*

Laughlin Phillips, *Editor, The Washingtonian*

Sterling Tucker, *Vice Chairman, District of Columbia Council*

From the Student Body

Carole Brill (undergraduate)

Donald Cresswell (graduate)

Roderick French (graduate)

Robert Meyer (undergraduate)

From the Alumni

Dana F. White

From Affiliated Programs

Robert H. Land (Library of Congress)

Atlee Schidler (Washington Center for Metropolitan Studies)

Wilcomb E. Washburn (Smithsonian Institution)

From the Faculty

The American Studies staff of instruction and the Faculty Advisory Committee, ex officio

Bachelor of Arts with a major in American Civilization (Field-of-Study).—Prerequisite: the Arts and Letters curriculum, page 78. AmCv 71-72 *Introduction to American Civilization* is recommended.

Required: the general requirements, pages 83-87, and the satisfactory completion of the American Civilization Major Examination and/or Essay during the senior year. The program is based on the development of a coordinated understanding of American civilization, past and present, acquired through the offerings of traditional departments and special courses within the program. Majors will be expected to develop a concentration of at least 18 semester hours in humanistic subjects, focusing on the United States but including relevant foreign background. A secondary emphasis of at least 12 semester hours will be expected in social science. Art, literature, philosophy, or religion may be chosen as a humanistic concentration; anthropology, economics, geography, political science, or sociology may be chosen as a social science; history may be chosen as either the humanistic concentration or the social science emphasis. As seniors, in AmCv 179-80, majors will be given an opportunity to coordinate and unify their varied curricular experiences.

Master of Arts in the field of American Civilization.—Prerequisite: the degree of Bachelor of Arts with an undergraduate major in American Civilization or in the subject in which concentration is contemplated.

Required: the general requirements, pages 91-97, including (1) AmCv 271-72 (6 semester hours), a seminar in the methods and materials for teaching and research in American Civilization; (2) 18 additional semester hours in a carefully related pattern, focusing on a concentrated approach to the study of American Civilization; (3) a Master's thesis (6 semester hours) written on an approved topic under the direction of the instructor in whose field the major emphasis falls; (4) a Master's Comprehensive Examination reflecting the candidate's area of concentration.

Doctor of Philosophy in the field of American Civilization.—This program combines work in the humanities and/or social sciences as preparation for research and teaching, with the option of stressing preparation for museum and library careers. Applicants are required to have an adequate background in the humanities and/or social sciences as they apply to the understanding of American civilization. See pages 91-95, 97-99, for requirements for the degree.

Fields of study for the doctorate: (1) *American History (Cultural, Economic, Political, Social), American Literature, History of Fine Arts and Folk Arts, The Negro in American Culture, Philosophy in America, The American Political Process, Urban Studies*, related fields such as *English Literature and European History*; (2) in affiliation with the Library of Congress—supervised historical study in bibliographic resources including *American History and Politics, Cartography, Cross-cultural Studies, Government Documents, Graphic Arts and Music, Motion Pictures and Recorded Sound, Printing and Book-making*; (3) in affiliation with the Smithsonian Institution—supervised studies including *Aspects of Cultural and Political*

History, Fine Arts and Folk Arts, History of American Arts and Manufacturers, History of Exploration, History of Science and Technology, Maritime History, Military History, Naval History. Additional fields of study may be arranged within the University and in both the Library of Congress and Smithsonian cooperative programs. Special announcements concerning these programs are issued periodically and are available in the Office of the Director of the American Studies Program.

AMERICAN CIVILIZATION

FIRST GROUP

71-72 Introduction to American Civilization (3-3)

Mondale

Themes and issues in American civilization since Colonial times, with emphasis on their contemporary importance. Recommended for sophomores who plan to major in American Civilization. (Academic year—day)

SECOND GROUP

101 American Civilization (3)

Walker and Staff

161-62 Studies in American Literature (3-3)

McCandlish

(Formerly AmCv 171-72)

Same as English 161-62. Major factors in the national cultural tradition as shown by outstanding writers. Prerequisite: Engl 51-52 or 71-72. (Academic year—day and evening)

181 Canada and the United States (3)

Introduction to a comparative study of Canada and the United States, focused on selected issues and subjects in related fields of interest. Materials from various disciplines, with emphasis on historical, literary, and cultural topics.

182 America and Europe (3)

Investigation of contradictory influences. From colonial times, America has been for Europe at once the lodestar of aspirations and a prime example of disrupted civilization. Europe has been to some Americans a model or lure and to others a symbol of decay. This complex, two-way emulation and rejection is studied from the time of Franklin and Benjamin West to that of Hollywood, the Blues, and the Beatles.

179-80 Proseminar in American Civilization (3-3)

Coordinating course for seniors majoring in American Civilization. (Academic year—day)

THIRD GROUP

271-72 Seminar: Research and Teaching in American Civilization (3-3)

Mondale, Walker

Consideration of American studies as an area for research and teaching; introduction to bibliography. Required of candidates for the degree of Master of Arts in the field of American Civilization. (Academic year—day)

***273-74 Research Seminar: Materials in American Negro Culture (3-3)**

Prerequisite: Hist 173-74 or equivalent.

281 Seminar: American Colonial Literature (3)*(Formerly AmCv 285)*

McCandlish

Same as Engl 281. (Fall—day)

295 Independent Studies (arr.)

Staff

Limited to Master's candidates. Permission of instructor, in writing, required. (Fall and spring)

299-300 Thesis Research (3-3)

Staff

(Academic year)

FOURTH GROUP**362 Readings in American Literature (3)**

McCandlish

Same as Engl 362. Limited to those students preparing for the Doctor of Philosophy general examination whose fields of study include American Literature. (Spring—day)

***373-74 Readings on the Negro in American Culture (3-3)**

For students preparing for the Doctor of Philosophy general examination in the field of the Negro in American Culture. (Academic year—day)

379-80 Readings in American Cultural History (3-3)

Mondale, Walker

(Formerly AmCv 381-82)

For students preparing for the Doctor of Philosophy general examination in the field of American Civilization. (Academic year—day)

398 Advanced Reading and Research (arr.)

Staff

Limited to students preparing for the Doctor of Philosophy general examination. May be repeated for credit. (Fall and spring)

399 Dissertation Research (arr.)

Staff

Limited to Doctor of Philosophy candidates. May be repeated for credit. (Fall and spring)

COURSES OFFERED IN AFFILIATION WITH THE LIBRARY OF CONGRESS

The Graduate School of Arts and Sciences is affiliated with the Library of Congress in a program leading to the degree of Doctor of Philosophy. The following courses are offered at the Library of Congress by members of its staff:

THIRD GROUP**255-56 Research Orientation Seminar: Americana in the Library of Congress (3-3)**

Examination of the collections of the Library of Congress with the aim of increasing understanding of American culture and awareness of library-oriented research problems and possibilities. For students in the affiliated doctoral program, this course may lead directly to a field in

* Joint offering of the Department of History and the American Studies Program. Students may register under either designation.

"Research Materials for the Study of American Life: Their Content, Collection, Arrangement, and Use." (Academic year—day)

FOURTH GROUP

355-56 Seminar: Advanced Library Research (3-3)

Introduction to practical problems of research in librarianship and control of collections. Supervised study in selected subject fields; emphasis on collections in the Library of Congress and concentrated work in a special collection. Prerequisite: AmCv 255-56. (Academic year)

389 Advanced Reading and Research (arr.)

Limited to students preparing for the Doctor of Philosophy general examination in fields offered in affiliation with the Library of Congress. May be repeated for credit. (Fall and spring)

390 Dissertation Research (arr.)

For Doctor of Philosophy candidates preparing dissertations based upon or significantly related to collections of the Library of Congress. Supervised by specialists at the Library. Prerequisite: AmCv 355-56. (Fall and spring)

COURSES OFFERED IN AFFILIATION WITH THE SMITHSONIAN INSTITUTION

The Graduate School of Arts and Sciences is affiliated with the Smithsonian Institution's Program for Graduate Students in the History of American Civilization. The following courses are offered at the Museum of History and Technology, by members of its staff:

THIRD GROUP

250 Orientation Course: Material Aspects of American Civilization (3)

Familiarization with the historical collections of the Smithsonian Institution and introduction to opportunities for research and publication based on historical objects. Required of all students in the Master's and doctoral programs affiliated with the Smithsonian Institution. (Fall—day)

FOURTH GROUP

351-52 Research in Selected Aspects of American Civilization (3-3)

Supervised study and/or field work in selected subject areas related to the activities of the Smithsonian Institution. Prerequisite: AmCv 250. (Academic year—day)

394 Advanced Reading and Research (arr.)

Limited to students preparing for the Doctor of Philosophy general examination in fields offered in affiliation with the Smithsonian Institution. May be repeated for credit. (Fall and spring)

395 Dissertation Research (arr.)

For Doctor of Philosophy candidates preparing dissertations significantly related to the material aspects of American civilization. Students work under curatorial supervision at the Smithsonian Institution. Prerequisite: AmCv 351-52. May be repeated for credit. (Fall and spring)

Anatomy

Professors I.R. Telford (*Chairman*), Paul Calabrisi, C.M. Goss (*Visiting—Medical History*), F.D. Allan, T.N. Johnson

Professorial Lecturer J.L. Angel

Associate Professor J.B. Christensen

Associate Clinical Professor R.N. Brown

Associate Professorial Lecturers J.A. Di Paolo, L.E. Church, Joan Blanchette

Assistant Professors E.N. Albert, Marilyn Koering

Assistant Professorial Lecturer R.G. Clark

Master of Science in the field of Anatomy.—Prerequisite: a Bachelor's degree from this University, or equivalent, with a major in a biological science or Chemistry. The undergraduate program must have included the following courses, or equivalent: B Sc 11-12; Chem 11-12, 51-52, 53-54; Phys 1, 2. Bioc 221-22 is recommended as an elective.

Required: the general requirements, pages 91-97, including Anat 202, 203, 204, 205, 221-22, 295, 299-300, and graduate courses in Biochemistry, Physiology, or related fields selected with the approval of the Department. It is not always possible to arrange courses and research so that the student can be assured of completing all the required work in one academic year.

Doctor of Philosophy fields of study in Anatomy: Electron Microscopy, Embryology, Gross Anatomy, Histology, Human Genetics, Neuroanatomy, and Physical Anthropology.—See pages 91-95, 97-99, for requirements for the degree.

202 Gross Anatomy (6)

Calabrisi and Staff

Regional dissections of adult cadaver supplemented with lectures and X-rays. Laboratory fee, \$30. (Fall—day)

203 Human Embryology (1)

Allan

Origin and development of human body; emphasis on value of embryology in interpreting anatomical anomalies. (Fall—day)

204 Neuroanatomy (2)

Johnson and Staff

Gross and microscopic anatomy of central nervous system and special senses. Laboratory fee, \$13. (Fall—day)

205 Microscopic Anatomy (3)

Telford and Staff

Microscopic structure of cells, tissues, and organs of the human body. Laboratory fee, \$13. (Fall—day)

221-22 Seminar (1-1)

Johnson and Staff

Research reports and discussions of special topics by staff and graduate students. (Academic year—day)

249 Introduction to Anatomical Research (1)

Telford and Staff

Major research techniques as applied to biological materials in the various anatomical disciplines. (Fall—day)

252 Physical Anthropology (1)

Angel

Variations in man and factors affecting him, human evolution and racial differences, anatomy and culture of ancient man. (Spring—day)

254 Fetal Anatomy (2)

Allan

Dissection of early and late human fetus. Comparison of fetal and adult structures. 20 students. Laboratory fee, \$10. (Spring—day)

- 256 **Human Genetics** (1) C.B. Jacobson
General principles of genetics, new cytogenetics technics, aneuploidy in man and its significance, biochemical aspects of heredity, genetic counseling. (Spring—day)
- 260 **Electron Microscopy in Cellular Biology—Lecture** (1) Blanchette
Anat 260 may be taken without 261. (Spring—day)
- 261 **Electron Microscopy in Cellular Biology—Laboratory** (2) Blanchette
Prerequisite or concurrent registration: Anat 260. 12 students. Laboratory fee, \$15. (Spring)
- 262 **Gross Anatomy of Upper and Lower Extremities** (2) Calabrisi
Detailed dissection, supplemented by X-ray anatomy; discussions, assigned reading. 24 students. Laboratory fee, \$10. (Spring—day)
- 264 **Gross Anatomy of Head and Neck** (2) Christensen
Detailed dissection, supplemented by X-ray anatomy; discussions, assigned reading. 24 students. Laboratory fee, \$10. (Spring—day)
- 266 **Gross Anatomy of Thorax and Abdomen** (2) Christensen
Detailed dissection, supplemented by X-ray anatomy; discussions, assigned reading. 24 students. Laboratory fee, \$10. (Spring—day)
- 268 **Gross Anatomy of Pelvis, Perineum, and Lower Extremity** (2) Calabrisi
Detailed dissection, supplemented by X-ray anatomy; discussions, assigned reading. 24 students. Laboratory fee, \$10. (Spring—day)
- 270 **Dissection of the Human Brain** (1) Johnson
Dissection of major pathways and nuclei of the brain with consideration of ventricular system; conferences and assigned reading. 20 students. Laboratory fee, \$10. (Spring—day)
- 272 **Autonomic Nervous System** (1) Allan
Development, microscopic and gross anatomy, function of central and peripheral components of autonomic nervous system. (Spring—day)
- 274 **Tissues of the Body** (1) Telford
Basic concepts in anatomy, with emphasis on primary tissues of the body—their histogenesis, growth, functions, regenerative capacities, aging, death. (Spring—day)
- 278 **History of Anatomy and Surgery** (1) Goss
Lectures and discussions related particularly to the lives and times of outstanding contributors to the advancement of the science of anatomy and surgery. (Spring—day)
- 295 **Research** (arr.) Staff
Content differs each time course is offered; may be repeated once for credit. Fee to be arranged. (Fall and spring)
- 299–300 **Thesis Research** (3–3) Staff
(Academic year)

- 398 Advanced Reading and Research (arr.)** Staff
 Limited to students preparing for the Doctor of Philosophy general examination. May be repeated for credit. (Fall and spring)

- 399 Dissertation Research (arr.)** Staff
 Limited to Doctor of Philosophy candidates. May be repeated for credit. (Fall and spring)

Anthropology

Adjunct Professor W.H. Crocker
 Professorial Lecturers J.L. Angel, Ruth McKay
 Associate Professor R.K. Lewis (*Chairman*)
 Assistant Professors Ruth Krulfeld, R.L. Humphrey, Jr., V.K. Golla, Suzanne Simons

Bachelor of Arts with a major in Anthropology (Departmental).—Prerequisite: the Arts and Letters curriculum, page 78, including Anth 1–2.

Required: in addition to the general requirements stated on pages 83–87, 24 semester hours in Anthropology, which must include 192 and second-group Anthropology courses in each of the following categories: Aspects of Culture (courses numbered in the 150's), Linguistics (courses numbered in the 160's), Ethnology (courses numbered in the 170's), and Physical Anthropology and Archeology (courses numbered in the 180's). Students in the senior year are encouraged to elect courses from the following: B Sc 108; Engl 115; Geol 154; Math 101; Phil 192; Psyc 115, 121; and Stat 104. Students are normally provided the opportunity to participate in field research conducted each summer by anthropological field schools in states of the American West. Opportunities for such research participation in South America are also periodically provided for exceptionally able students selected by the staff member conducting the field research.

Master of Arts in the field of Anthropology.—Prerequisite: the degree of Bachelor of Arts with a major in Anthropology from this University, or equivalent.

Required: the general requirements, pages 91–97. All courses must be approved in advance by the adviser. The Master's Comprehensive Examination must be taken before registration for the second half of the thesis work.

Departmental prerequisite: Anth 1–2 is prerequisite to all second-group courses in Anthropology.

FIRST GROUP

- 1–2 Introductory Anthropology (3–3)** Staff

Anth 1: survey of man's origin, physical evolution, and culture history.

Anth 2: survey of the world's cultures, illustrating the principles of cultural behavior. (Academic year—day and evening)

SECOND GROUP

- 150 Comparative Value Systems (3)** Krulfeld

Examination of world views, conceptual systems, and value orientations of representative cultures throughout the world. (1971–72 and alternate years)

- 151 Introduction to Primitive Economics (3)** Krulfeld
Comparative study of various economic organizations, including hunters and gatherers, herders and cultivators. (Fall—day)
- 153 Psychological Anthropology (3)** McKay
Relevance of psychological theories to human evolution and the cross-cultural study of personality. Cultural determinants of personality formation and mental health. (Fall—day)
- 154 Mythology and Folklore (3)** Golla
Unwritten literature as an expression of imaginative and creative thought; the place of mythology and folklore in social organization, in enculturation, and in social control. (Spring—day)
- 155 Primitive Religion (3)** Simons
Conceptions of the supernatural in nonliterate societies. Examination of religious beliefs and practices. (Fall—day)
- 157 Primitive Social Organization (3)** Simons
The analysis of the social organization of primitive peoples; kinship, economic, and political systems. (Spring—day)
- 158 Art and Culture (3)** Krulfeld
Study of the art of tribal society, including the role of art in culture, influences upon the artist, and beliefs and practices associated with art production. (Spring—day)
- 159 Ethnoscience (3)** Staff
Comparative study of branches of knowledge, such as astronomy, botany, mathematics, psychology, technology, and zoology, as these are empirically derived and systematically arranged in selected preindustrial societies. (1970-71 and alternate years: fall—evening)
- 161 Language and Culture (3)** Golla
Structure and semantics of systems of human communication; linguistic change; influence of language on world view. (Fall—day)
- 162 Linguistics in Anthropology (3)** Golla
Introduction to general (descriptive and comparative) linguistics. (Fall)
- 170 Cultures of the Caribbean (3)** Simons
Study of the culture history and ways of life of Indian groups of the area during the ethnographic present. (1971-72 and alternate years)
- 171 Native Peoples of North America (3)** Humphrey
Comparative study of Indian groups representative of each of the culture areas of the continent. (1970-71 and alternate years: fall—day)
- 172 Native Peoples of South America (3)** Staff
Survey of Indian groups representative of each of the culture areas of the continent. (1971-72 and alternate years)
- 173 Cultures of the Pacific (3)** Lewis
Study of the culture history and ways of the life of the native peoples of Melanesia, Micronesia, and Polynesia. (Fall—day)

- 174 **Far Eastern Communities** (3) Krulfeld
Community study approach in anthropology as applied to selected villages in such Asian areas as China, Japan, and Malaysia. (Spring—day)
- 175 **Cultures of Southeast Asia** (3) Krulfeld
Study of representative Southeast Asian cultures from primitive groups to high civilizations. (Spring—day)
- 176 **Cultures of the Circumpolar Region** (3) Humphrey
Survey of the social and economic adaptations to an extreme climate made by peoples of the northern sub-arctic and arctic regions of North America and Eurasia. (1971-72 and alternate years)
- 177 **Cultures of the Near East** (3) Lewis
Study of the geographic environment, language, religion, and social structure of settled and nomadic peoples of the Near East; emphasis on the Arab world. (Spring—day)
- 178 **Cultures of South and East Africa** (3) Lewis
Comparative examination of the history, cultural development, and contemporary problems of cultures of southern and eastern Negro Africa. (1971-72 and alternate years)
- 179 **Cultures of West and Central Africa** (3) Lewis
Comparative examination of the history, cultural development, and contemporary problems of cultures of western and central Negro Africa. (1971-72 and alternate years)
- 182 **New World Archeology** (3) Humphrey
Survey of North American culture history from man's entry into the Americas during the Pleistocene period until the time of the first European contacts. (Fall—day)
- 183 **Old World Archeology** (3) Humphrey
Survey of human prehistory in Europe, Africa, and Asia from the earliest hominid cultures to the beginnings of advanced agricultural civilizations and their secondary centers. (Spring—day)
- 185 **Latin American Archeology** (3) Humphrey
The culture history of pre-Columbian Mexico and Central America from the Paleo-Indian period through the Spanish Conquest, emphasizing the origin and development of Latin American high civilizations. (1971-72 and alternate years)
- 186 **Physical Anthropology** (3) Angel
Study of human variation past and present, seen as a product of physical and cultural evolution. (Spring—evening)
- 192 **Anthropological Theory** (3) Krulfeld
Analysis of the theoretical postulates and assumptions underlying the development of modern cultural anthropology. (Fall—day)
- 193 **Anthropological Methods** (3) Krulfeld
Approaches to library and field research. Conceptual bases and bias in the delineation of problems; in the selection, analysis, and organization of data; and in the preparation of the final report. (Spring—day)

THIRD GROUP

- 261 Field Methods in Linguistics (3)** Golla
Principles of interviewing and recording various linguistic dialects; techniques of observation of cultural variables which influence linguistic choice. (Spring—day)
- 262 Seminar: Applied Anthropology (3)** Staff
Use of anthropological methods and techniques in such specific fields as government, community development, business, law, and medicine. (Fall—day)
- 263 Seminar: Culture Contact and Change (3)** Simons
Western impact on non-Western cultures. Workings and processes of social change as variant cultures and ethical systems interact. (1971-72 and alternate years)
- 264 Seminar: Museum Techniques (3)** Humphrey
Principles of collection, classification, preservation, identification, and interpretation of specimens; presentation to the public of the cultural significance of prepared specimens; research and instructional use of the museum. Field trips to area museums. (Fall—day)
- 265 Seminar: Method and Theory in Archeology (3)** Humphrey
Analysis of field techniques, dating methods, and theoretical approaches in reconstructing and interpreting the cultures of the past, utilizing the most recent archeological techniques. (1971-72 and alternate years)
- 266 Seminar: Technology (3)** Humphrey
Cross-cultural examination of the form, function, meaning, and use of material culture and the behavior patterns involved in its production. (1971-72 and alternate years)
- 267 Seminar: Economic Anthropology (3)** Krulfeld
Comparative study of preindustrial systems of production, distribution, and consumption. (Fall—day)
- 268 Seminar: Peasant Society (3)** Krulfeld
Cross-cultural analysis of peasant societies, including an examination of their manner of functioning within their larger social, economic, and cultural context. (1971-72 and alternate years)
- 269 Seminar: Structural Problems (3)** Simons
Comparative survey of principles of descent, kinship terminology, and formation of descent groups; problems of variation and change in kinship systems and development of kinship models. (Spring—day)
- 273 Seminar: Culture of Poverty (3)** Liebow
Cross-cultural consideration of basic assumptions about the life of the poor within pluralistic societies with the aim of gaining theoretical insights into the nature of culture itself. (1970-71 and alternate years: fall—day)
- 274 Seminar: Afro-American Culture (3)** McKay
An ethnographic survey of racial, linguistic, and cultural attributes of Americans of African ancestry. African antecedents, conditions of migra-

tion, experiences in slave and free communities over their 350-year history in the United States. (Spring—day)

282 Seminar: Advanced Archeology—North American Prehistory (3) Humphrey

Analysis in depth of current archeological problems relating to the origin and development of aboriginal American cultures. (Spring—day)

283 Seminar: Advanced Archeology—Old World (3) Staff

Study, in detail, of the beginnings of human culture and the development of civilization in the Old World. (1971–72 and alternate years)

287 Seminar: Problems in Latin American Civilization (3) Rodríguez

Interdisciplinary seminar guided by a specialist within the methodology of his chosen discipline; each student writes a report on some aspects of a key theme (i.e., Nationalism) in Latin America's experience. Admission by permission of instructor. (Spring—day)

295 Research (arr.)

May be repeated for credit. (Fall and spring) Staff

299–300 Thesis Research (3–3) Staff

(Academic year)

Art

Professors D.C. Kline, W.A. MacDonald, L.P. Leite (*Chairman*)

Professorial Lecturer Grace Evans

Associate Professors Roland Fleischer, F.S. Grubar, D.H. Teller

Assistant Professors H.I. Gates, Lilien Hamilton, W.T. Woodward, Fuller Griffith (Graphics)

Assistant Professorial Lecturer R.G. Stewart

Lecturers Jane Kofler, Barbara Braun

Studio Lecturers on the Staff of the Corcoran School of Art Jack Perlmutter (*Printmaking*), Alexander Russo (*Painting*), Joseph Taney (*Advertising Design*), Teruo Hara (*Ceramics*), James Twitty (*Painting*), Berthold Schmutzhart (*Drawing*), A.B. Stevenson (*Painting*), Thomas Downing (*Painting*), Robert Foster (*Calligraphy and Lettering*), Samuel Holvey (*Design*), Edwin McGowin, Frank Wright (*Drawing and Design*), Harold Baskin (*Advertising Design*), W.S. Dutterer (*Design*), E.W. Frederick (*Etching and Relief Printing*), J.F. Giampaoli (*Drawing*), Jack Lefkowitz (*Design*), R.M. Stackhouse (*Painting*), Krystyna Swiecicki (*Serigraphy*), D.T. Corrigan (*Sculpture and Drawing*), Jerry Lake (*Photography*), R.G. Osuna (*Film Making*), Evelyn Dyer (*Drawing and Design*), Leon Berkowitz (*Painting*), W.A. Christenberry, Jr. (*Painting*), W.A. Lombardo (*Painting*)

Bachelor of Arts with a major in Art History and Theory (Departmental).—Prerequisite: the Arts and Letters curriculum, page 78, or equivalent, including Art 31–32.

Required: the general requirements, pages 83–87; 21 semester hours, as follows: Art 101 or 102, 104 or 105, 109 or 110, 112, 113 or 114, 117 or 118, 137. In addition, 9 semester hours selected from second-group courses, or from third-group courses

open to undergraduates with the approval of the instructor. Phil 162 is recommended as a senior-year elective. Students intending to major in this field are urged to acquire a reading knowledge of a foreign language, preferably German or French, at the earliest possible convenience.

Art History and Theory majors may apply for graduation with Special Honors. In order to be accepted to this program, students must apply in writing to the Chairman of the Department, fulfill the general requirements (see page 49), and, prior to admission to the program, pass a reading examination in either French or German administered by the Department of Art. Upon acceptance, the student will be assigned one or more faculty advisers under whose direction he will undertake a supervised program of selected reading on which he will be required to submit written, critical reports.

Bachelor of Arts with a major in Fine Arts (Departmental).—Prerequisite: the Arts and Letters curriculum, page 78, or equivalent, including Art 21–22 and 31–32.

Required: in addition to the general requirements, pages 83–87, 27 semester hours in Fine Arts; Phil 162 or equivalent; 6 hours of Art History selected from second-group courses or from third-group courses open to undergraduates with the approval of the instructor. A maximum of 12 of the required 27 hours in Fine Arts may be taken in any one of the following fields: painting, design, sculpture, graphics, and ceramics; the remainder are to be selected from three of these fields.

Fine Arts majors may apply for graduation with Special Honors. In order to be accepted to this program students must apply in writing to the Chairman of the Department and fulfill the general requirements (see page 49). Upon acceptance, the student will be assigned a faculty adviser(s) to direct a project which will be assigned to him in his special area of interest. At the conclusion of the project, the student will present a one-man exhibit prepared exclusively outside of class, and he will be examined by an Honors Board.

Bachelor of Arts with a major in Classical Archeology and Greek (Departmental).—This interdepartmental major may be arranged in conjunction with the Department of Classics. Prerequisite: the Arts and Letters curriculum, page 78, including Clas 13–14 and Hist 39–40.

Required: the general requirements, pages 83–87, including 12 semester hours of second-group courses in Greek; Clas 137–38; Anth 183; Art 101, 102, 103, 111; Hist 109, 110; Phil 111. A reading knowledge of French or German is recommended.

Master of Arts in the field of Art History and Theory with concentrations in Classical Art and Archeology, American Art, Renaissance and Baroque Art, and Contemporary Art.—Prerequisite: the degree of Bachelor of Arts with a major in Art History and Theory at this University, or equivalent. Applicants from other institutions must present scores on the Graduate Record Examination to the Office of the Graduate School of Arts and Sciences.

Required: the general requirements, pages 91–97. As many as possible of the 24 semester hours in course work should be third-group courses. The courses must be completed in 6 semesters or less, with a grade of A in at least 6 semester hours of work, and with an overall quality-point index of at least 3.25. A reading knowledge examination, preferably in German or French, must be passed after completing 9 semester hours of course work. A general written Master's Comprehensive Examination on the problems in the field of Art History and Theory and a written thesis (equivalent to 6 semester hours) embodying the result of research on some specific topic in the history and theory of art are also required. For details, see the pamphlet on the Master of Arts in the field of Art History and Theory, which is available in the offices of the Chairman of the Department of Art and the Dean of the Graduate School of Arts and Sciences.

Master of Arts in the field of Museology.—Prerequisite: the degree of Bachelor of Arts with a major in Art History and Theory at this University, or equivalent.

Required: the general requirements, pages 91–97. Prospective candidates should consult the Department for specific requirements.

Master of Fine Arts in the field of Painting, Sculpture, Ceramics, or Graphics.—Prerequisite: the degree of Bachelor of Arts with a major in Fine Arts in the field of Painting, Sculpture, Ceramics, or Graphics at this University, or equivalent.

Required: the general requirements, pages 91–97. In lieu of the foreign language requirement, Master of Fine Arts candidates are required to take 3 additional semester hours of course work selected from Art 137, 181–82; as many as possible of the remaining 24 semester hours of course work should be in third-group courses. A creative thesis (equivalent to 6 semester hours) in painting, sculpture, ceramics, or graphics, and a paper discussing some technical phase of the problem illustrated by the thesis are also required. For details, see the pamphlet on the Master of Fine Arts, which is available in the offices of the Chairman of the Department of Art and the Dean of the Graduate School of Arts and Sciences.

Bachelor of Arts in Education with a teaching field in Art.—Prerequisite: the Education curriculum, page 80.

Required: the Art option and professional courses listed on pages 106, 115–16.

ART HISTORY AND THEORY

FIRST GROUP

31–32 Survey of Western Art (3–3)

Hamilton and Staff

Survey of the arts in the Western World from prehistoric to modern times. A foundation for further study in the history of art. (Academic year—day and evening)

71–72 Introduction to the Arts in America (3–3)

Kline, Grubar

Painting, sculpture, and architecture of America, with selected references to crafts and popular arts. Art 71: from Colonial beginnings to the Republican Age. Art 72: from early 19th century to the present. (Academic year—day and evening)

SECOND GROUP

101 Greek and Roman Architecture (3)

MacDonald

(Fall—day)

102 Greek and Roman Sculpture (3)

MacDonald

(Spring—day)

103 Classical Iconography (3)

MacDonald

Origin and development of myths in classical art. (Fall—day)

104 Renaissance Art in Italy I (3)

Evans

Early developments from the 13th to the 15th century. (Fall—day)

105 Renaissance Art in Italy II (3)

Leite

High Renaissance and Mannerism.

106 Renaissance Art in the North I (3)

Fleischer

Fifteenth century painting in the Netherlands, Germany, France, Spain, and Portugal. (Fall—day)

107 Renaissance Art in the North II (3)

Fleischer

Sixteenth century painting in the Netherlands, Germany, France, Spain, and Portugal. (Spring—evening)

- 108 **18th Century Art in Europe** (3) Fleischer
Development of painting, sculpture, and architecture. (Spring—evening)
- 109 **19th Century Art in Europe** (3) Leite, Hamilton
Painting and sculpture from Academism to Symbolism. (Fall—day)
- 110 **Contemporary Art** (3) Leite
Painting and sculpture in 20th century Europe. (Fall—day)
- 111 **Classical Archeology** (3) MacDonald
Archeological monuments of classical civilizations, with intensive study of one or more areas selected from architecture, sculpture, painting, or minor arts.
- 112 **Art of Egypt and the Ancient Orient** (3) MacDonald
Study of the art of Mesopotamia, Anatolia, Egypt, and Persia. (Spring—day)
- 113 **Baroque Art in Italy** (3) Leite
Development of painting, sculpture, and architecture in 16th and 17th century Italy.
- 114 **Baroque Art in the North** (3) Fleischer
Development in painting, sculpture, and architecture in the 16th and 17th centuries in Holland, Flanders, Spain, France, Germany, and England. (Fall—day)
- 115 **Christian Iconography** (3) Leite
Origins and development of Christian symbols and themes from early Christian to modern times.
- 117 **Medieval Art I** (3) Evans
Architecture, sculpture, and painting of the early Christian and Byzantine periods. (Fall—day)
- 118 **Medieval Art II** (3) Evans
Architecture, sculpture, and painting of the Romanesque and Gothic periods.
- 119 **Pre-Romanesque Art in the North** (3) Evans
The Carolingian and Merovingian periods. (Spring—day)
- 120 **Art of China and Japan** (3) Kline
Architecture, painting, and sculpture of China, Korea, and Japan. (Fall—day)
- 141 **Interior Decoration** (3) Kline
Principles of decoration dealing with furniture designs and ensemble layout, draperies, color, accessories, and lighting.
- 142 **House Planning** (3) Kline
Planning the contemporary house for family living, including site problems, the case plan, materials of building, and climate conditioning.

- 145 **Folk Arts in America** (3) Kline
Ceramics, woodcarving, ironwork, decorative painting, weaving, and other crafts.

- 147 **Pre-Columbian Art** (3) Braun
An introduction to pre-Columbian art in Mexico, Central America, and South America from its beginnings to the Spanish conquest. Examination of architecture, sculpture, ceramics, and painting of the great civilizations of the Olmec, Teotihuacan, Maya, Aztec, Chavín, Mochica, and Inca.

- 148 **19th Century American Painting** (3) Grubar
(Spring—day)

- 149 **19th Century American Sculpture** (3) Grubar
(Spring—day)

THIRD GROUP

- 201 **Principles of Museum Work** (3) Stewart
(Formerly Art 146)

A required introductory course for graduate study in museology. Field trips to galleries and museums. History and development of museums; problems of museum administration, connoisseurship, cataloguing, installation, conservation, and educational service. (Fall and spring—evening)

- *203 **Primitive Art** (3) Kline
Arts of prehistoric and primitive man in Europe, the pre-Columbian Americas, Oceania, and Africa. (Spring—day)

- *207 **Modern Architecture** (3) Kline
Development of modern architecture and building technology in Europe and America from the late 19th century to the present. (Fall—day)

- 216 **Medieval Painting** (3) Evans
Painting and the decorative arts.

- 220 **Seminar: Baroque Art of the 17th Century** (3) Fleischer, Leite
A reading knowledge of German desirable. (Fall—day)

- 221 **Seminar: Renaissance Art** (3) Fleischer, Leite
A reading knowledge of German desirable. (Spring—day)

- 243 **Seminar: American Art** (3) Kline, Grubar
Specific area announced in *Schedule of Classes*. (Fall—day)

- 244 **Seminar: 19th Century Art** (3) Leite
Specific area announced in *Schedule of Classes*. Reading knowledge of French desirable.

- 245 **Seminar: 20th Century Art** (3) Grubar, Leite
Specific area announced in *Schedule of Classes*. (Spring—evening)

* May be taken for undergraduate credit with the approval of the instructor.

- 246 **Seminar: Classical Art** (3) MacDonald
Specific area announced in *Schedule of Classes*. (Fall—day)
- 247 **Seminar: Medieval Art** (3) Evans
(Spring—evening)
- 248 **Independent Research** (3)
Open only to Master's degree candidates. To be arranged in consultation with individual instructors. May be repeated for credit. (Fall and spring)
- 261 **Seminar: Problems in Art History** (3) Staff
As determined by the instructor, this course will deal with the theory, criticism, or methodology of art history. May be repeated for credit. Topic to be announced in *Schedule of Classes*. (Fall—evening; spring—day)
- 263–64 **Research Seminar in American Art** (3–3)
Selected themes offered in conjunction with the National Collection of Fine Arts and the Smithsonian Institution. Open to students admitted to graduate study in the field of Art History and Theory with a concentration in American Art. Registration only after consultation with the Department Chairman.
- 270 **Problems of Museum Work** (3) Staff
As determined by the instructor, this course will deal with such problems as those of connoisseurship, conservation, administration, education, installation, etc. May be repeated for credit. Topic to be announced in *Schedule of Classes*. (Fall and spring)
- 271–72 **Museum Techniques** (6–6) Staff
(Aca-
Intern training in museum work. Prerequisite: Art 201, 270. Academic year— 4 hours daily, Monday through Friday)
- 289–90 **Thesis Research** (3–3) Staff
(Academic year)

FINE ARTS

Unless otherwise indicated, Fine Arts courses taught in University studios carry no material or laboratory fees; students must purchase their own materials. Laboratory and material fees for courses taught at the Corcoran School of Art are stated in the course description and are payable at the School.

Courses designated CSA are taught at the Corcoran School of Art.

Departmental prerequisite: Art 21–22 or permission of Department Chairman is prerequisite to all other studio courses in Art.

FIRST GROUP

*21–22 **Design I: Basic** (3–3) Staff

Fundamental studies of principles and elements of design. Art 21: study of two-dimensional design. Art 22: three-dimensional studies. (Art 21 and 22: fall and spring)

* Required of all Fine Arts majors.

- 41-42 **Drawing I** (3-3) CSA Staff
 Concepts of drawing: perception, analysis of form, use of media.
 (Academic year—day and evening)
- 51-52 **Ceramics I** (3-3) CSA Staff
 Basic techniques for clay preparation, hand forming, wheel throwing, and the application of slip glazes and vitreous glazes through workshop and illustrated lectures. Laboratory fee, \$45 a semester. (Academic year—day and evening)
- 57-58 **Graphics I** (3-3) Griffith
 Exploration of the methods of intaglio, relief, block printing, lithography, and other composite processes. (Academic year—day and evening)
- 61-62 **Water Color** (3-3) CSA Staff
 Painting in transparent and opaque water color and in acrylic. Experimentation and new media. (Academic year—day)
- 65-66 **Painting I** (3-3) CSA Staff
 Experimentation with media. Color—theory and analysis. (Academic year—day and evening)
- 81-82 **Sculpture I** (3-3) CSA Staff
 Three-dimensional design. Basic sculptural techniques; modeling, carving, and construction. Media include wood, clay, stone, plaster. Laboratory fee, \$20 a semester. (Academic year—day and evening)

SECOND GROUP

Second-group Art courses may be repeated for credit with approval of Department.

- *121-22 **Design II: Structured** (3 or 6-3 or 6) Gates
 Structured course that extends the student's design experience through a series of problems involved with both two- and three-dimensional media. Emphasis on problem solving through experimentation with materials and tools. (Academic year—day)
- 123-24 **Design III: Individual Problems** (3-3) Staff
 Emphasis on the individual student and the problems and materials that specifically interest him in any area of design. Prerequisite: Art 121-22. (Academic year)
- †125-26 **Painting II** (3 or 6-3 or 6) CSA Staff
 Concepts of painting. Attitudes, approaches, personal statements. (Academic year—day and evening)
- †127-28 **Painting III** (3 or 6-3 or 6) Woodward
 Exploration of problems in developing a personal visual imagery. Materials and model fee, \$12 a semester. (Academic year—day)
- †131-32 **Ceramics II** (3 or 6-3 or 6) CSA Staff
 Basic techniques in clay and glaze formation, advanced wheel throwing and hand forming. Laboratory fee each semester: \$45 for 3 semester hours; \$60 for 6 semester hours. (Academic year—day and evening)

* Fine Arts majors with concentrations in design may elect 6 semester hours of credit.

† Fine Arts majors and Master of Fine Arts candidates should elect 6 semester hours of credit.

137 Workshop in Materials, Methods, and Techniques (3) Woodward

Drawing in charcoal, crayon, and pen; painting and preparation of grounds in tempera, encaustic, fresco buono, oil, watercolor, polymer, and mixed techniques; graphic techniques in woodcut, engraving, etching; modeling in clay and carving in wood and stone; mosaic. Materials and model fee, \$2. (Fall and spring—day)

139–40 Design Workshop (3–3) Gates

Exploration of design possibilities in wood, metal, textile, plastics, and other materials.

143–44 Serigraphy (3–3) Teller

Advanced problems in serigraphy; emphasis on its aesthetic possibilities. Prerequisite: Art 57–58. (Academic year—day)

***151–52 Ceramics III (3 or 6–3 or 6) CSA** Staff

Glaze calculation, experimentation in reduction firing, individual problems in formation techniques, and problems in series production for the studio artist. Advanced decorating and finishing techniques. Laboratory fee each semester: \$45 for 3 semester hours; \$60 for 6 semester hours. (Academic year—day and evening)

***153–54 Graphics II (3 or 6–3 or 6)** Griffith

Advanced relief, intaglio, lithographic, and other composite processes. Prerequisite: Art 57–58. (Academic year—day)

***157–58 Graphics III (3 or 6–3 or 6)** Griffith

Exploration of combined techniques and mixed media. Prerequisite: Art 153–54. (Academic year—day)

159–60 Drawing II (3–3) CSA Staff

Development of drawing. Individual study, application and extensions of drawing. (Academic year—day and evening)

161–62 Fundamentals of Photography (3–3) CSA Staff

Study of the fundamental techniques of photography; emphasis on creative expression. Laboratory fee, \$25 a semester. (Art 161: fall—day and evening. Art 162: fall—day; spring—evening.)

165–66 Composition (3–3) CSA Staff

Critical study of design and representation in painting and drawing. Relationship to aesthetic potential. (Art 165: fall—evening. Art 166: spring—day and evening.)

167 Design: Visual Communication (3) CSA Staff

Development of concepts and layouts—incorporating typography, illustrations, or photographs—for brochures, bookjackets, displays, graphics for film media. (Fall and spring—day and evening)

168 Design: Advanced Visual Communication (3) CSA Staff

Development of graphic designs, layouts, professional formats for magazine spreads, posters, advertisements, trademarks, letterheads, packages. Development of professional portfolio. (Fall and spring—day and evening)

* Fine Arts majors and Master of Fine Arts candidates should elect 6 semester hours of credit.

169 Design: Typography (3) CSA

Staff

Imaginative use of words and the integration of words and pictures in graphic design for advertising, etc.; study of type styles, methods, and specification writing; practical experience in typography laboratory. (Fall and spring—day)

170 Design: Typography and Illustration (3) CSA

Staff

Experimentation with various illustration techniques in advertising and editorial design. Special problems in typography. Study of reproduction processes to prepare art work for printing. (Fall and spring—day)

171-72 Calligraphy and Lettering (3-3) CSA

Staff

Consideration of the basic alphabets and their use in calligraphy, lettering, and typography. (Academic year—day)

173-74 Advanced Calligraphy and Lettering (3-3) CSA

Staff

Design and appropriate use of present-day letter forms. Consideration of type faces and use in contemporary typography. (Academic year—day)

175-76 Design Projects (3-3) CSA

Staff

Advanced general design problems in two, three, and four dimensions. Unusual media and techniques; pure concept problems stressed. (Academic year—day)

177-78 Rendering (3-3) CSA

Staff

Methods and techniques of visual representation as used in the professional design fields; survey of modern illustrative styles. (Academic year—day)

***179-80 Sculpture II (3 or 6-3 or 6) CSA**

Staff

Concepts of sculpture. New materials and developments. Laboratory fee each semester: \$20 for 3 semester hours; \$30 for 6 semester hours. (Academic year—day and evening)

***181-82 New Media (3-3) CSA**

Staff

New media: plastic, lights, epoxy, rubber, styrafoam, and kinetic machinery. Laboratory fee, \$10 a semester. (Academic year—day and evening)

***189-90 Sculpture III (3 or 6-3 or 6) CSA**

Staff

Advanced study concentrating on relevance of scale and media. Relationship of sculpture to the environment. Laboratory fee each semester: \$20 for 3 semester hours; \$30 for 6 semester hours. (Academic year—day and evening)

191-92 Advanced Photography (3-3) CSA

Staff

Advanced problems in photography; emphasis on creative expression and individual development. Laboratory fee, \$25 a semester. (Academic year—day and evening)

193 Film Making (3) CSA

Staff

Designed for the student with limited knowledge of the techniques and procedures in film making. The student will create his own short film. Laboratory fee, \$90. (Fall and spring—evening)

* Fine Arts majors and Master of Fine Arts candidates should elect 6 semester hours of credit.

THIRD GROUP

All third-group Art courses may be repeated for credit with the approval of the Department.

- *231-32 Design IV (3 or 6-3 or 6)** Gates
New media and techniques in three-dimensional design. (Academic year)
- *234 Design V (3 or 6)** Staff
Presentation, model building, and specifications of materials in three-dimensional problems. (Academic year)
- *235 Design VI (3 or 6)** Teller
Designing and executing textiles using the techniques of silk screen, block print, and batik. (Academic year)
- 249 Theory of Design (3)** Teller
Application of design principles to painting, architecture, sculpture, and minor arts of today. Relationship of design principles to the contemporary artist and his work. Open to undergraduate students with permission of instructor.
- *251-52 Ceramics IV (3 or 6-3 or 6) CSA** Staff
Personal glaze and clay formulation. Methods of instruction for the student who plans to teach. Laboratory fee each semester: \$45 for 3 semester hours; \$60 for 6 semester hours. (Academic year—day and evening)
- *253 Ceramics V (3 or 6) CSA** Staff
Laboratory fee: \$45 for 3 semester hours; \$60 for 6 semester hours. (Fall and spring)
- *255-56 Graphics IV: Serigraphy (3 or 6-3 or 6)** Teller
Prerequisite: Art 157-58. (Academic year)
- *257-58 Graphics V: Etching and Engraving (3 or 6-3 or 6)** Griffith
Prerequisite: Art 157-58. (Academic year)
- *259 Graphics VI: Lithography (3 or 6)** Griffith
(Fall and spring)
- *260 Graphics VII: Relief Printing (3 or 6)** Griffith
(Fall and spring)
- *265-66 Painting IV (3 or 6-3 or 6)** Woodward
Creative painting; students encouraged to work on independent projects as well as assigned problems. Materials and model fee, \$12 a semester. (Academic year—evening)
- *275 Painting V (3 or 6)** Woodward
Materials and model fee, \$12. (Fall or spring)
- *279-80 Sculpture IV (3 or 6-3 or 6) CSA** Staff
Laboratory fee each semester: \$20 for 3 semester hours; \$30 for 6 semester hours. (Academic year)

* Fine Arts majors and Master of Fine Arts candidates should elect 6 semester hours of credit.

***281 Sculpture V (3 or 6) CSA**

Staff

Laboratory fee: \$20 for 3 semester hours; \$30 for 6 semester hours.
(Fall and spring)

299-300 Thesis Research (3-3)

Staff

Astronomy

See "Physics."

Biochemistry

Professors C.R. Treadwell (*Chairman*), B.W. Smith, G.V. Vahouny, J.M. Bailey
Professorial Lecturers W.W. Burr, Jr. (*Isotopes*), R.W. Albers (*Brain*), Roscoe
Brady, Jr. (*Brain*), Arnold Schaefer, Edward Steers, Jr., W.F. Anderson
(*Genetics*), H.L. Ozer, Gordon Guroff, Martin Flavin, Thomas Deuel (*Enzy-
mology*), A.N. Schechter
Assistant Professors Glenn Walker, Linda Gallo (*Research*), Barbara Howard
(*Research*)
Special Lecturers Walter Mertz (*Inorganic Metabolism*), J.C. Smith, Jr.

Master of Science in the field of Biochemistry.—Prerequisite: a Bachelor's degree.
The undergraduate program must have included the following courses, or equivalent:
B Sc 11-12; Chem 11-12, 22, 51-52, 53-54; Phys 1, 2.

Required: the general requirements, pages 91-97, including Bioc 221-22, 227, 299-300. The remaining courses are to be selected from Bioc 224, 232, 241, 262, 295; or, with the approval of the adviser, from graduate courses in Chemistry, Microbiology, Physiology, or Pharmacology. It is usually not possible to arrange courses and research so that the student can be assured of completing all of the required work in one academic year.

Master of Science in the field of Mycology.—An interdepartmental degree offered by the departments of Biochemistry, Epidemiology and Environmental Health, and Microbiology.

Prerequisite: a Bachelor's degree with a major in Biology, Botany, Chemistry, or Zoology, from this University; or equivalent. The undergraduate program should have included the following courses, or equivalent: B Sc 11-12; Chem 11-12, 51-52, 53-54.

Required: the general requirements, pages 91-97. The 33 semester hours required in this program must include Bioc 221-22; Epid 201, 217, 230; Micr 201, 225, 231; and *Thesis Research* (299-300).

Doctor of Philosophy fields of study in Biochemistry: *Amino Acid Metabolism; Animal Nutrition; Biochemical Evolution; Biochemistry of Cancer; Biochemistry of Tissue Culture; Carbohydrate Metabolism; Chemistry and Metabolism of Carbohydrates, Lipids, Proteins; Complex Lipids; Intermediary Metabolism; Lipids; Metabolism of Purines and Pyrimidines; Metabolic Relationships of Insulin; Protein Biosynthesis; Protein Metabolism; Endocrinology; Metabolism; Metabolism of Connective Tissue; Nutrition; Tissue Respiration; and Vitamins.*—See pages 91-95, 97-99, for requirements for the degree.

* Fine Arts majors and Master of Fine Arts candidates should elect 6 semester hours of credit.

- 221-22 General Biochemistry (4-4)** Vahouny
Lectures and laboratory. Prerequisite: Chem 52, 54. Material fee, \$20 a semester. (Academic year—day)
- 224 Biochemistry of Enzymes (1)**
Biochemistry of enzymes and enzyme reactions. Prerequisite: Bioc 221. (Spring—day)
- 225 Biochemical Procedures (3)** B. Smith and Staff
Laboratory course. Material fee, \$16. Content differs each time course is offered; may be repeated for credit. (Spring)
- 227 Biochemistry Seminar (1)** Staff
Current literature in biochemistry. Content differs each time course is offered; may be repeated for credit. (Fall and spring—day)
- 232 Proteins and Amino Acids (1)** Steers
Prerequisite: Bioc 221. (Spring—Saturday morning)
- 241 Isotopes (3)** Burr
Theoretical characterization of isotopes and their applications in biology. Attention given to counting, health physics and radiation safety, autoradiography, chromatography. Laboratory fee, \$16. (Spring—day)
- 251 Carbohydrate Metabolism (1)**
Prerequisite: Bioc 222. (1971-72 and alternate years: spring—day)
- 252 Biochemistry of the Brain (1)** Albers, Brady
For medical students; open to limited number of graduate students. Recent biochemical developments in structure, functions, and metabolic processes unique to the brain. (Spring—day)
- 254 Human Nutrition (1)** Pollack
For medical students; open to limited number of graduate students. Application of nutritional principles in humans. (Spring—day)
- 256 Biochemistry of Organ Function (1)** Kramer
For medical students; open to limited number of graduate students. Emphasis on biochemical processes unique to particular organ systems; application of these processes to evaluation of function. (Spring—day)
- 258 Inherited Metabolic Diseases (1)** Ozer
For medical students; open to limited number of graduate students. Contribution of molecular biology to understanding of human mutations and hereditary diseases. Specific disease states and genetics of protein structure discussed. Prerequisite: Bioc 222. (Spring—Saturday morning)
- 260 Biochemistry of the Steroids (1)** O. Dodek
For medical students; open to limited number of graduate students. Basic chemistry of the steroids, pathways of biosynthesis and metabolism, regulatory mechanisms, physiologic effects, clinical measurement of endogenous steroids, clinical manifestations of steroid imbalance, steroid changes in pregnancy, and steroid therapy. (Spring—day)

262 Biochemistry of the Lipids (1)

Vahouny

Research techniques for study of lipid biochemistry. 1970-71 and alternate years: metabolism of lipids, including digestion, energy production, biosynthesis, function in specialized tissues and subcellular structures. 1971-72 and alternate years: chemistry, properties, occurrence of important classes of biological lipids. Content differs each time course is offered; may be repeated for credit. (Spring—day)

266 Biochemical Genetics (1)

Anderson

For medical students; open to limited number of graduate students. (Spring—Saturday morning)

295 Research in Biochemistry (arr.)

Staff

Participation in a project under investigation in the Department or one in a related field suggested by the student and approved by the Staff. Content differs each time course is offered; may be repeated for credit. (Fall and spring)

299-300 Thesis Research (3-3)

Staff

(Academic year)

398 Advanced Reading and Research (arr.)

Staff

Limited to students preparing for the Doctor of Philosophy general examination. May be repeated for credit. (Fall and spring)

399 Dissertation Research (arr.)

Staff

Limited to Doctor of Philosophy candidates. May be repeated for credit. (Fall and spring)

Biological Sciences

Professors I.B. Hansen, Edith Mortensen, S.C. Munson, A.H. Desmond (*Chairman*), R.L. Weintraub

Professorial Lecturers K.C. Kates, L.B. Smith

Associate Professors Caroline Adams, Kittie Parker, D.S. Douglas, S.O. Schiff

Associate Professorial Lecturers J.R. Buchheit, R.S. Sigafos, W.A. Shropshire, Jr.

Assistant Professors W.G. Nash, D.L. Atkins

Assistant Professorial Lecturers P.E. Spiegler, Jessie Dickens

Lecturers R.C. Johnson, Barbara Sickles, Bernice Radovich, Barbara Timberlake

Adjunct Lecturers T.E. Bowman, R.F. Cressey, W.D. Hope, M.L. Jones, L.S. Kornicker, D.L. Pawson, H.A. Rehder, Joseph Rosewater, C.F. Roper, F.A. Chace, Jr.

Bachelor of Arts or Bachelor of Science with a major in Biology (Departmental).—Prerequisite: the Arts and Letters or the Science curriculum, respectively, pages 78-79, including B Sc 11-12, or former 1-2, or equivalent; Chem 11-12; Chem 51-52 and 53-54, or 50. Phys 1, 2; Math 30, 31 strongly recommended.

Required: in addition to the general requirements, pages 83-87, a minimum of 24 semester hours of second-group courses which should include at least 6 hours in Biology, 6 in Botany, 6 in Zoology.

Bachelor of Arts or Bachelor of Science with a major in Botany (Departmental).—Prerequisite: the Arts and Letters or the Science curriculum, respectively, pages 78–79, including B Sc 11–12, or former 1–2, or equivalent; Chem 11–12; Chem 51–52 and 53–54, or 50. Phys 1, 2; Math 30, 31 strongly recommended.

Required: in addition to the general requirements, pages 83–87, a minimum of 24 semester hours of second-group courses in Botany or in a combination of Botany and Biology.

Bachelor of Arts or Bachelor of Science with a major in Zoology (Departmental).—Prerequisite: the Arts and Letters or the Science curriculum, respectively, pages 78–79, including B Sc 11–12, or former 1–2, or equivalent; Chem 11–12; Chem 51–52 and 53–54, or 50. Phys 1, 2; Math 30, 31 are strongly recommended.

Required: in addition to the general requirements, pages 83–87, a minimum of 24 semester hours of second-group courses in Zoology or Biology.

Master of Science in the field of Biology.—Prerequisite: the equivalent of a Bachelor's degree from this University with a major in Biology, Botany, or Zoology. The undergraduate program must have included the following courses, or equivalent: Chem 51–52 and 53–54, or 50; Math 31; Phys 1, 2.

Required: the general requirements, pages 91–97.

Master of Science in the field of Botany.—Prerequisite: the equivalent of a Bachelor's degree from this University with a major in Botany or Biology. The undergraduate program must have included the following courses, or equivalent: Chem 51–52 and 53–54, or 50; Math 31; Phys 1, 2.

Required: the general requirements, pages 91–97.

Master of Science in the field of Zoology.—Prerequisite: the equivalent of a Bachelor's degree from this University with a major in Zoology or Biology. The undergraduate program must have included the following courses, or equivalent: Chem 51–52 and 53–54, or 50; Math 31; Phys 1, 2.

Required: the general requirements, pages 91–97.

Doctor of Philosophy fields of study in Biology: Cell Physiology, Cytogenetics, Cytology, and Molecular Genetics.—See pages 91–95, 97–99, for requirements for the degree.

Doctor of Philosophy fields of study in Botany: Cytogenetics, Microbial Genetics, Mycology, Paleobotany, Photobiology, Plant Ecology, Plant Pathology, Plant Physiology—Microorganisms, Plant Physiology—Vascular Plants, Taxonomy, and Virology.—See pages 91–95, 97–99, for requirements for the degree.

Doctor of Philosophy fields of study in Zoology: Aquatic Ecology; Comparative Physiology; Entomology—Insect Physiology; Herpetology; Histophysiology; Radiation Biology; Taxonomy, Anatomy, and Physiology of Mollusks; Vertebrate Anatomy and Taxonomy; Vertebrate Embryology and Morphogenesis; and Vertebrate Ichthyology.—See pages 91–95, 97–99, for requirements for the degree.

Doctor of Philosophy in the field of Biophysics (an interdepartmental field offered by the departments of Biological Sciences, Physics, and Physiology, see pages 214–17. See pages 91–95, 97–99, for requirements for the degree.

Bachelor of Arts in Education with a teaching field in Biology.—Prerequisite: the Education curriculum, page 80.

Required: the Biology option and the professional courses listed on pages 107, 115–16.

Departmental prerequisite: B Sc 11–12 or former 1–2 is prerequisite to all second-group courses (exception: B Sc 163) in Biology, Botany, and Zoology, except by permission of the instructor.

BIOLOGY

FIRST GROUP

3-4 Introductory Biology for Nonscience Majors (3-3) Schiff

Lecture (2 hours), laboratory (2 hours). Survey of biological principles; emphasis on man as a functional organism in his environment. Material fee, \$10 a semester. (Academic year—day and evening)

11-12 Introductory Biology for Science Majors (4-4) Staff

Lecture (3 hours), laboratory (3 hours). Biological principles and problems designed to furnish a base for advanced studies in biology and related sciences. Material fee, \$10 a semester. (Academic year—day)

SECOND GROUP

108 Organic Evolution (3) Munson

Theories of organic evolution and present ideas on principal lines of development in the plant and animal kingdoms; review of mechanisms involved in the process. (Fall and spring—day)

112 Bacteriology (4) Weintraub

Lecture (2 hours), laboratory (4 hours). Introduction to structure, activities, biological roles, and industrial uses of bacteria and some related organisms. Prerequisite: one year of chemistry. Material fee, \$11. (Fall—day)

115 Cytology (4) Schiff

Lecture (1 hour), laboratory (4 hours). Morphological and physiochemical properties of plant and animal cells and their components. Analysis of slides, cytological techniques, and preparation of slides. Recommended: one year of chemistry. Material fee, \$11.

118 Advanced Cytology (3) Schiff

Lecture (1 hour), laboratory (4 hours). Cell mechanisms, including chromosome pairing and movement, bacterial, viral, and human cytogenetics, sex determination, chromosome abnormalities, and cytology of cancer cells. Laboratory will be in the nature of a cytological project, to be selected by the student with the concurrence of the instructor. Prerequisite: B Sc 115. Material fee, \$11.

119 Cell Biochemistry (4) Weintraub

Lecture (2 hours), laboratory (3 hours). Introduction to composition and metabolism of generalized cells of plants, animals, and microorganisms. Prerequisite: Chem 11-12; 50 or 51-52; or equivalent. Material fee, \$11. (Spring—evening)

120 Cell Physiology (4) Weintraub

Lecture (2 hours), laboratory (3 hours). Study of cell processes including absorption, excretion, growth, division, contraction, conduction, locomotion, and photosynthesis. Prerequisite: B Sc 119 or permission of instructor. Material fee, \$11. (Fall—evening)

122 Cell and Molecular Biology (3)

Survey of structure and function of cells of animals, plants, and microorganisms and their subcellular organelles, including study of the proc-

esses of cellular absorption, excretion, growth, division, differentiation, association, ageing, contraction, locomotion, energy transduction, conduction, photosynthesis, and bioluminescence. Prerequisite: one semester of organic chemistry.

127 Genetics (4)

Nash

Lecture (3 hours), laboratory (2 hours). Introductory course. Basic aspects of transmission of genetic traits with particular reference to the chemical basis of heredity and gene action. Material fee, \$8. (Fall and spring—day)

138 Advanced Genetics (3)

Nash

Emphasis on genetic studies with bacteria, bacteriophage, certain fungi (biochemical genetics), and some aspects of human genetics. Original papers in the field of chromosome mechanics and cytogenetics will be considered. Prerequisite: introductory course in genetics. (Spring—day)

167 Radiation Biology (3)

Schiff

Nature of radioactive particles and emissions; their effects on biological materials, chiefly at the cellular level; genetic effects of radiation. Recommended but not required: two years of biological sciences and chemistry or physics. (Fall—day)

171 Undergraduate Research (arr.)

Staff

Admission by permission of the staff member concerned. May be repeated for credit. (Fall and spring)

181-82 Senior Seminar (1-1)

Staff

An integrating and coordinating course for seniors majoring in Biology, Botany, or Zoology. (Academic year—day)

THIRD GROUP**206 Seminar: Radiation Biology (3)**

Schiff

Actions of different kinds of radiation on living material at subcellular, cellular, and organismal levels; effects of environmental alterations on radiation-induced damage; practical considerations of exposure to radioactivity. Prerequisite: B Sc 167 or equivalent. (Spring—evening)

207 Seminar: Origin of Life (3)

Weintraub

(1971-72 and alternate years: fall—evening)

219 Seminar: Topics in Cell Biochemistry (3)

Weintraub

(1970-71 and alternate years: spring—evening)

220 Seminar: Cell Physiology (3)

Shropshire

Review in depth of selected topics. (1971-72 and alternate years)

227 Seminar: Genetics (3)**295 Research (arr.)**

Staff

Investigation of special problems. May be repeated for credit. and spring)

(Fall

299-300 Thesis Research (3-3)

Staff

(Academic year)

FOURTH GROUP

- 398 **Advanced Reading and Research** (arr.) Staff
 Limited to students preparing for the Doctor of Philosophy general examination. May be repeated for credit. (Fall and spring)
- 399 **Dissertation Research** (arr.) Staff
 Limited to Doctor of Philosophy candidates. May be repeated for credit. (Fall and spring)

BOTANY

SECOND GROUP

- 105 **Local Flora** (3) Parker
 Lecture (2 hours), laboratory and field (4 hours). Field and laboratory studies on local flora; emphasis on the woody plants. Material fee, \$5. (Fall—day)
- 106 **Field Botany—Lower Plants** (3) Adams
 Lecture (1 hour), laboratory and field (4 hours). Primarily for non-specialists, emphasizing algae, mosses, and ferns.
- 109 **Structure of Seed Plants** (3) Adams
 Lecture (1 hour), laboratory (4 hours). Morphology, anatomy, and histology of seed plants. Material fee, \$8. (Fall—day)
- 110 **Lower Plants** (3) Adams
 Lecture (1 hour), laboratory (4 hours). Structure, life cycle, phylogeny, ecology, and economic importance of algae, fungi, mosses, and ferns. Material fee, \$8. (Spring—day)
- 125 **Flowering Plants** (3) Parker
 Lecture (2 hours), laboratory and field (4 hours). Origin, development, phylogeny, and principles of classification of flowering plants. Material fee, \$5. (Spring—day)
- 132 **Mycology** (4)
 Lecture (2 hours), laboratory (3 hours). Material fee, \$8.
- 134 **Plant Pathology** (4)
 Lecture (2 hours), laboratory (3 hours). Material fee, \$8.
- 135 **Plant Physiology** (4) Weintraub
 Lecture (2 hours), laboratory (4 hours). Physiology of seed plants with emphasis on growth, development, tropisms, and reproduction. Prerequisite: Chem 11–12. Recommended: B Sc 119 and Chem 50 or 51–52. Material fee, \$11. (Spring—day)
- 141 **Plant Ecology** (4) Sigafos
 Lecture (2 hours), laboratory (4 hours).
- THIRD GROUP
- 221 **Seminar: Plant Taxonomy** (3) Parker
 (1971–72 and alternate years)

235 Seminar: Plant Physiology (3)**242 Seminar: Plant Ecology (3)**

(1971-72 and alternate years)

Sigafos

299-300 Thesis Research (3-3)

Staff

ZOOLOGY**SECOND GROUP****101-2 Invertebrate Zoology (3-3)**

Mortensen

Lecture (1 hour), laboratory (4 hours). Systematic study of invertebrate forms, including morphology, physiology, classification, life histories, and phylogenetic relationships. Material fee, \$11 a semester. (Academic year—day)

104 Comparative Vertebrate Anatomy (4)

Lecture (2 hours), laboratory (4 hours). Origin, early history, gross and comparative anatomy of vertebrates. Dissection of representative present-day forms. Material fee, \$11. (1970-71 and alternate years: fall—day and evening, spring—day; 1971-72 and alternate years: fall and spring—day)

143 Animal Ecology (4)

Staff

Lecture (3 hours), laboratory and field (3 hours). Material fee, \$8. (Fall—day)

144 Aquatic Ecology (4)

Staff

Lecture (3 hours), laboratory and field (3 hours). Principles applied to aquatic systems with special references to physicochemical properties, typical habitats and communities. Prerequisite: B Sc 143 or permission of instructor. Laboratory fee, \$8. (Spring—day)

145 Introduction to Vertebrate Embryology (3)

Hansen

Lecture (1 hour), laboratory (4 hours). Origin and early development of the individual, formation of organ systems. Emphasis on frog, chick, and pig, with reference to human embryo. Material fee, \$8. (1970-71 and alternate years: fall and spring—day; 1971-72 and alternate years: fall—day and evening, spring—day)

148 Histology (4)

Desmond

Lecture 2 (hours), laboratory (4 hours). Introduction to microscopical anatomy of normal tissues and organs. Material fee, \$8. (1970-71 and alternate years: fall and spring—day; 1971-72 and alternate years: fall—day, spring—evening)

152 Protozoa (3)

Mortensen

Lecture (1 hour), laboratory (4 hours). Introduction to protozoa: classification, life histories, and physiology; emphasis on free-living types. Material fee, \$8. (1971-72 and alternate years)

154 Vertebrate Zoology (4)

Lecture and discussion (2 hours), laboratory and field (4 hours). Vertebrate morphology and natural history; discussion of variation and adapta-

tion in vertebrate forms, including identification, ecology, and natural history of vertebrates with emphasis on the vertebrates of the Middle Atlantic States. Prerequisite: B Sc 104 or permission of instructor. Material fee, \$8. (Spring—evening)

155 Parasitology (3)**Kates**

Lecture (1 hour), laboratory (4 hours). Introduction to animal parasitology; survey of parasitic types from protozoa through arthropods. Material fee, \$8. (Fall—evening)

157 Comparative Endocrinology (3)**Desmond**

Endocrine systems of vertebrate classes. Differences and similarities between endocrine mechanisms of fish, amphibians, reptiles, birds, and mammals, to illustrate broad trends of evolution in endocrine systems. (Fall—day)

161 Entomology (3)**Munson**

Lecture (2 hours), laboratory (2 hours). Elementary morphology, physiology, and ecology of insects; introduction to taxonomy of more important groups. Material fee, \$8. (1971-72 and alternate years)

162 Insect Physiology (3)**Munson**

Lectures and laboratory on physiology of insects. Admission by permission of instructor. Material fee, \$8. (1971-72 and alternate years: spring—day)

163 Human Physiology (4)**Douglas**

Lecture (3 hours), laboratory (3 hours). Introduction to the function of organ systems of the human body. Intended for nonbiology majors. Prerequisite: B Sc 3-4 or equivalent. Material fee, \$11. (Fall—day)

164 Vertebrate Physiology (4)**Douglas**

Lecture (3 hours), laboratory (3 hours). Survey of the chemical and physical basis of function in vertebrate organ systems. Experiments with a variety of animals illustrate classical as well as modern approaches to animal physiology. Background in biology and chemistry strongly recommended. Material fee, \$11. (Spring—day)

THIRD GROUP**204 Seminar: Invertebrate Zoology (3)****Mortensen**

Study of original publications on hormones of invertebrate animals. (Fall—evening)

245 Histochemistry (3)**Desmond**

Theory and application of chemical techniques in determining changes in the amount and distribution of inorganic and organic constituents of tissues during different physiological and pathological conditions. (1971-72 and alternate years)

247 Morphogenesis (3)**Hansen**

Lectures and reports on experimental morphology. Emphasis on early embryonic development. Prerequisite: B Sc 145 or equivalent. (1971-72 and alternate years: spring—evening)

- 250 Seminar: Regeneration (3)** Hansen
Discussions and reports on theories and experimental evidence in both vertebrate and invertebrate animals. (1970-71 and alternate years: spring—evening)
- 251 Seminar: Vertebrate Zoology (3)** Desmond
Study of current publications in the field of histophysiology. (1970-71 and alternate years: spring—evening)
- 265 Comparative Animal Physiology (3)** Douglas
Introduction to study of the physiological basis of adaptation of animals to environments. Attention given to animals with ability to live under unusual or extreme environmental conditions. (Fall—evening)
- 299-300 Thesis Research (3-3)** Staff
(Academic year)

Biology

See "Biological Sciences."

Biophysics—Graduate Study

COMMITTEE ON BIOPHYSICS 1969-70

C.S. Tidball (*Chairman*), A.H. Desmond, Marvin Eisenberg, Julian Eisenstein, M.J. Jackson, Herbert Jehle

The Graduate School of Arts and Sciences offers an interdepartmental program leading to the degree of Doctor of Philosophy in the field of Biophysics. This interdepartmental program is directed by the departments of Biological Sciences, Physics, and Physiology. Entry into this program may be made through any one of these departments; however, the final program must be approved by the Committee on Biophysics. Interested students should consult either the Chairman of the Committee on Biophysics or the chairman of the department of Biological Sciences, Physics, or Physiology.

No field of undergraduate study is stipulated; however, the undergraduate program must have included the following courses, or equivalent: B Sc 11-12; Chem 22; Math 33 or 24; Phys 32, 52. In addition, candidates should present advanced undergraduate work in either chemistry, mathematics, or physics.

Doctor of Philosophy fields of study in Biophysics: Electron Microscopy, Experimental Biophysics, Instrumentation, Membrane Physics, Membrane Transport, Molecular Biology, Neurobiology, and Theoretical Biophysics.—See pages 91-95, 97-99, for requirements for the degree.

The courses to be taken prior to the General Examination will normally be selected from the following:

ANATOMY

- 205 Microscopic Anatomy (3)** Telford and Staff
260 Electron Microscopy in Cellular Biology—Lecture (1) Blanchette
261 Electron Microscopy in Cellular Biology—Laboratory (2) Blanchette

APPLIED SCIENCE*

113 <i>Engineering Analysis I</i> (3)	Staff
114 <i>Engineering Analysis II</i> (3)	Staff
211 <i>Mathematical Methods in Applied Science I</i> (3)	Staff
212 <i>Mathematical Methods in Applied Science II</i> (3)	Staff
213 <i>Mathematical Methods in Applied Science III</i> (3)	Staff
214 <i>Mathematical Methods in Applied Science IV</i> (3)	Staff
215 <i>Mathematical Methods in Applied Science V</i> (3)	Staff

BIOCHEMISTRY

221-22 <i>General Biochemistry</i> (4-4)	Vahouny
241 <i>Isotopes</i> (3)	Burr
258 <i>Inherited Metabolic Diseases</i> (1)	Ozer

BIOLOGICAL SCIENCES

BIOLOGY

112 <i>Bacteriology</i> (4)	Weintraub
115 <i>Cytology</i> (4)	Schiff
118 <i>Advanced Cytology</i> (3)	Schiff
119 <i>Cell Biochemistry</i> (4)	Weintraub
120 <i>Cell Physiology</i> (4)	Weintraub
167 <i>Radiation Biology</i> (3)	Schiff

ZOOLOGY

148 <i>Histology</i> (4)	Desmond
164 <i>Vertebrate Physiology</i> (4)	Douglas
245 <i>Histochemistry</i> (3)	Desmond

CHEMISTRY

111-12 <i>Physical Chemistry</i> (3-3)	Wood
113-14 <i>Physicochemical Measurements</i> (2-2)	Schmidt, Rowley
122 <i>Instrumental Analysis Lectures</i> (2)	Schmidt
213 <i>Chemical Thermodynamics</i> (3)	Wood

ELECTRICAL ENGINEERING*

60 <i>Introductory Electrical Engineering—Laboratory I</i> (2)	Staff
61 <i>Introductory Electrical Engineering—Laboratory II</i> (2)	Staff
153 <i>Design of Switching Systems</i> (3)	Staff
154 <i>Digital Computer Design</i> (3)	Staff
157 <i>Machine and Assembly Language Programming</i> (3)	Staff
161-62 <i>Electrical Engineering Laboratory</i> (2-2)	Staff
184 <i>Introduction to Medical Engineering</i> (3)	Eisenberg
256 <i>Analog and Hybrid Computers</i> (3)	Staff
257 <i>Digital Computer Programming Systems</i> (3)	Staff

* See the School of Engineering and Applied Science Catalogue.

281 <i>Electronic Measurements in Medicine</i> (3)	Staff
282 <i>Instrumentation in Medical Electronics</i> (3)	Staff
283 <i>Introduction to Medicine for Engineers I</i> (3)	Eisenberg
284 <i>Introduction to Medicine for Engineers II</i> (3)	Eisenberg

MATHEMATICS

111 <i>Mathematics for Engineers and Physicists I</i> (3)	Liverman and Staff
112 <i>Mathematics for Engineers and Physicists II</i> (3)	Liverman and Staff
139 <i>Advanced Calculus I</i> (3)	Liverman and Staff
140 <i>Advanced Calculus II</i> (3)	Liverman and Staff
142 <i>Theory of Differential Equations</i> (3)	Staff

MEASUREMENT SCIENCE*

131 <i>Measurement Laboratory</i> (3)	Staff
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MECHANICAL ENGINEERING*

280 <i>Advanced Thermodynamics</i> (3)	Staff
295 <i>Statistical Thermodynamics</i> (3)	Staff

MICROBIOLOGY

201 <i>Medical Microbiology</i> (6)	Parlett and Staff
231 <i>Cellular Immunology</i> (2)	Staff
233 <i>Molecular Biology of Viruses</i> (4)	Robbins, Huang
257 <i>Immunochemistry</i> (3)	Wright

PHARMACOLOGY

201 <i>Pharmacology</i> (8)	Mandel and Staff
256 <i>Molecular Pharmacology</i> (2)	F. Hahn

PHYSICS

163 <i>Optics</i> (3)	Staff
164 <i>Thermodynamics</i> (3)	Staff
165-66 <i>Electromagnetic Theory</i> (3-3)	Staff
167 <i>Principles of Quantum Physics</i> (3)	Staff
168 <i>Applied Quantum Physics</i> (3)	Staff
170 <i>Elementary Solid State Physics</i> (3)	Staff
172 <i>Biophysics</i> (3)	Jehle
233-34 <i>Quantum Mechanics</i> (3-3)	Prats
241 <i>Statistical Mechanics</i> (3)	Jehle
243 <i>Solid State Physics: Structure and Binding</i> (3)	Staff
244 <i>Solid State Physics: Electronic Processes in Metals</i> (3)	Staff
248 <i>Elementary Particles</i> (3)	Jehle
249 <i>Statistical Processes</i> (3)	Zuchelli

PHYSIOLOGY

191 <i>Selected Topics in Human Structure and Function</i> (3)	Kenney
201 <i>Physiology</i> (8)	Staff

* See the School of Engineering and Applied Science Catalogue.

- 271 *Electronic Instrumentation* (3) Lavine
 273 *Investigative Electron Microscopy* (3) Cassidy

STATISTICS

- 113 *Computer Programming* (3) Thomas and Staff
 114 *Introduction to Computer Operating Systems* (3) Thomas and Staff
 115 *Programming Languages* (3) Thomas and Staff
 117 *Analysis of Variance* (3) Staff
 118 *Regression Analysis* (3) Staff
 197 *Digital Computer Programming with Applications* (3) Thomas

Botany

See "Biological Sciences."

Business Administration

- Professors J.L. Jessup, J.C. Dockeray, R.B. Eastin, H.R. Page (*Chairman*), Frederick Amling
 Professorial Lecturers L.C. Collins, R.A. Kaye, K.F. McClure, J.P. Murphy, J.F. Doubleday, W.G. Torpey
 Associate Professors E.R. Magruder, P.D. Grub, Guy Black, Rodney Eldridge, E.J. Mock, R.F. Hartley, R.A. Barrett, G.P. Lauter, S.F. Divita
 Associate Professorial Lecturers L.B. Pouliot, W.G. Wells, Jr., J.F. Regan, R.W. Hagauer, J.G. Birdsong, J.C. Susbauer, P.L. Foster, Siegfried Garbuny, P.M. Dickie
 Assistant Professors L.C. Smith, G.F. Conner, J.R. Roman, Jr., S.N. Sherman
 Adjunct Assistant Professor Norma Loeser
 Assistant Professorial Lecturers G.J. Glassman, N.R. Harbaugh, L.R. Brown, P.M. LoRusso, I.L. Mueller, J.R. Potter, Jr.
 Lecturers C.R. Julian, W.R. Johnston, R.O. Lundquist

Programs of study in Business Administration leading to the degrees of *Bachelor of Business Administration*, *Master of Business Administration*, and *Doctor of Business Administration* are offered by the School of Government and Business Administration (see pages 127-52).

FIRST GROUP

- 51 *Introduction to Business* (3) Page, Conner, Jones
 The business environment; structure, activities, and problems of business enterprise; its contribution to society; careers in business. (Fall—day and evening; spring—day)

SECOND GROUP

- 102 *Fundamentals of Management* (3) Conner, Mantell
 Planning, organizing, directing, coordinating, and controlling activities of the administrative unit; evolution of management thinking. (Fall and spring—day and evening)

- 105 Personnel Management (3)** Barrett, Allen
The labor force and labor markets. Industrial personnel and manpower programs, organizations and policy in personnel activities. (Fall—day; spring—evening)
- 106 Problems in Personnel Management (3)** Loeser, Magruder
Principles and problems of personnel management and industrial relations illustrated by cases drawn from industry and government. Prerequisite: B Ad 105. (Fall—evening; spring—day)
- 107 Collective Bargaining (3)** Barrett, L. Smith
Characteristics of American unionism and collective bargaining; economic, social, and public policy considerations. Management's role in the negotiation and administration of collective bargaining agreements. Prerequisite: B Ad 105 or permission of instructor. (Fall—evening)
- 109 Office Management (3)** Lundquist
Organization and management of the office, office and information systems, planning and execution of work, systems analysis, supervision problems.
- 113 Real Estate (3)** Doubleday
Principles of urban real estate practice; leasing and property management, valuation, appraisal, financing, taxation, urban growth, urban renewal. (Fall—evening)
- 118 Introduction to Data Processing (3)** Demoady, Waldrip
Basic principles and methods of data processing. Introduction to fundamentals, potentials, and problems of automatic data processing as a tool of management. (Fall and spring—day)
- 119 Data Processing Programming (3)** W. Smith
Basic principles and methods of computer programming. Introduction to computer programming concepts; form and character of instructions and programming schema for leading types of digital electronic computers. Prerequisite: B Ad 118 or permission of instructor. (Spring—day)
- 120 Data Processing Systems (3)** Demoady, Waldrip
Basic principles and methods of data systems analysis, design, and implementation. Emphasis on relationship between equipment systems and management information systems; development of data processing systems. Prerequisite: B Ad 118 or permission of instructor. (Fall—day)
- 121 Fundamentals of Insurance (3)** Doubleday, Wells
Function of insurance in the economic life of business and individuals; risk planning, conservation, management. (Fall—evening)
- 122 Insurance Estate Planning (3)** Doubleday
Estate programming, role of insurance in providing protection and estate development, disposition of the individual estate. (Spring—evening)
- 131 Business Finance (3)** Mock, Amling, Foster
Basic principles involved in the financing of business enterprises. Prerequisite: Acct 1-2. (Fall—day; spring—day and evening)

- 132 International Business Finance (3)** Eldridge
Introduction to principles, practices, problems, and institutions of international finance. Emphasis on international financial markets, exchange rates, balance of payments restraints, and governmental policies. Prerequisite: Econ 1-2. (Fall—day)
- 133 Capital Formation (3)** Eldridge
Survey of the process of capital formation in a free enterprise economy. Focus on the roles of business firms, financial intermediaries, money and capital market institutions, governmental regulatory agencies, and the fiscal and monetary policies of governments. Prerequisite: Acct 1-2, B Ad 131. (Spring—day)
- 135 Managerial Finance (3)** Mock
Functions and objectives of financial management; problems of internal financial analysis, forecasting, planning, and control; management of corporate capital; problems of capital supply; case studies. Prerequisite: Acct 193, B Ad 131. (Spring—day)
- 138 Investment and Portfolio Management (3)** Amling, Foster
Principles of security investments: analysis of specific security investments and security markets, industry studies, portfolio construction and management. Prerequisite: Acct 1-2, B Ad 131. (Fall—evening)
- 141 Basic Marketing Management (3)** Divita, Lundquist
Introduction to marketing and marketing management in relation to our total economy and business management, consumer and demand analysis, retailing, wholesaling, major marketing management problems and policies with emphasis on major decision areas and tools. Prerequisite: Econ 1-2. (Fall—evening; spring—day)
- 142 Retail Marketing (3)** Hartley
Retail marketing perspective; problems of location, financing, merchandising policy, advertising and sales promotion, operating policy. Trends in retailing. Prerequisite: B Ad 141.
- 143 Marketing Research (3)** Hartley, Lundquist
Principles and practices of marketing research with particular emphasis on basic methods and techniques, sources and interpretation of data, and presentation of results. Prerequisite: B Ad 141. (Fall—evening)
- 144 International Marketing Management (3)** Lauter
Introductory course; analysis of the international marketing position of the United States, channels for international marketing, international advertising media, legal aspects of international marketing, methods of preparing foreign market surveys, development of policies. (Fall—evening)
- 145 Sales Management (3)** Hartley
Organization of sales department, sales planning and forecasting, quotas, territories, performance standards, and analysis and control of distribution costs. Prerequisite: B Ad 141. (Spring—evening)
- 147 Advertising (3)** Hartley
Advertising as a function of marketing and merchandising; uses and limitations of advertising as a tool of management; fundamentals involved in getting a finished advertisement before potential customers; evaluation, criticism, and control of advertising. (Spring—day)

- 158 Physical Distribution Management (3)** Potter
Distribution from shipper's point of view: problems of plant location, inventory control, warehousing; traffic management emphasized, including private carriage. Prerequisite: Econ 1-2. (Fall—evening)
- 161 Commercial Law: Contracts, Sales, Agency, Bailments (3)** Collins, McClure, Murphy
(Fall—day and evening)
- 162 Commercial Law: Negotiable Instruments, Property, Mortgages (3)** Collins, McClure, Murphy
(Spring—day and evening)
- 163 Law in Relation to the Form of Business Units: Corporations, Partnerships, and Trusts (3)** Murphy
- 171 Principles of Transportation (3)** J. Roman
Impact of intercity transportation systems on society. Emphasis on modal differences in development, economic characteristics, and regulation. Prerequisite: Econ 1-2. (Fall—day)
- 172 Public Utilities (3)** Glassman
Legal and economic meaning of public utility concept; development, services, economic characteristics, rate making, and regulation of utility industries, with emphasis on electric, gas, and telephone industries. Prerequisite: Econ 1-2. (Spring—evening)
- 173 Transportation Systems Management (3)** J. Roman
Comparative study, from the standpoint of various carrier modes, of management problems common to all modes of domestic and international transportation. Prerequisite: Econ 1-2. (Spring—day)
- 174 Urban Transportation (3)** J. Roman
Problems of developing balanced transportation systems for urban areas—area needs, modal evaluation, cost effectiveness, finance, and marketing. Prerequisite: Econ 1-2 or equivalent. (Fall—evening)
- 175 Introduction to Foreign Trade (3)** Kaye, Waldrip
The physical movement of goods in international business; conditions essential for successful trading; development of a hypothetical export shipment, including examples of documentation required and discussion of procedural problems from a management point of view. Emphasis on ocean marine insurance and export traffic management policy. Prerequisite: Econ 1-2. (Fall and spring—evening)
- 176 International Business Theory and Policy (3)** Eldridge
Causal relationships underlying international business transactions, role of government in international trade, international agreements between private producers, trade with developing nations, developing international business policy. Prerequisite: Econ 1-2. (Spring—evening)
- 177 Foreign Markets (3)** Staff
Patterns of world trade by countries and commodities, selected regional analysis, and in-depth market studies. Prerequisite: B Ad 144 or permission of instructor. (Spring—evening)

178 Management of International Business Operations (3)Dickie, Grub,
Waldrip

Analysis of overseas projects according to purpose and type of organization; case studies involving development and management of overseas marketing programs and other operations in different world areas. Prerequisite: B Ad 175 or permission of instructor. (Spring—evening)

181 Manufacturing Production (3)

Birdsong

Basic principles and methods of manufacturing production. Manufacturing facilities, plant and equipment. Illustrations selected from various process and fabrication industries. (Spring—evening)

191 Business Reports and Analyses (3)

Johnston, Jones

Sources of management information, array and analysis of data, interpretation and presentation of findings. (Fall—day and evening; spring—day)

198 Case Problems in Management (3)

Eastin, Susbauer

Principles and techniques of management illustrated by cases drawn from business and industry. Prerequisite: B Ad 102, 105, 131, 141. (Fall—day; spring—day and evening)

THIRD GROUP**201 Social Environment of Business (3)**

Divita

American business history stressing social influences. Business problems faced, decisions made, and actions taken by the historical succession of owners and managers. Business responsibility, ethics, and morality. (Fall—evening)

203 Legal Environment of Business (3)

Staff

Business under the U.S. Constitution, Federal legislation, legal precedents, and agency orders. Major emphasis on Supreme Court decisions relating to business.

208 Personnel Management and Industrial Relations (3)

Barrett, Magruder

Survey of personnel management practices and procedures, including labor-management relations. (Fall—day; spring—evening)

209 Seminar: Personnel Management (3)

Eastin

Discussion of industrial personnel and manpower management, and research in advanced problems. (Fall—evening)

210 The Personnel Manager (3)

Jessup

The personnel manager and his place in the organization, relations of personnel manager to other executives, personnel manager's policy role and relations with chief executive. Key problems of the senior personnel executive. Prerequisite: B Ad 208 or permission of instructor. (Spring—evening)

212 Unionism and Collective Bargaining (3)

L. Smith, Barrett

The American labor movement. Collective bargaining and the conduct of labor relations under collective bargaining agreements. (Fall—evening)

213 Current Issues in Unionism, Collective Bargaining, and Labor Relations (3) L. Smith, Barrett

Current problems and issues. Prerequisite: B Ad 212. (Spring—evening)

215 European Common Market (3)

Analysis of treaty establishing European Economic Community; institution of EEC and of member states and the internal law of member states as they affect doing business in EEC; series of problems arising out of establishing and operating business with and within EEC. Background in international law and antitrust law desirable. (Same as Law 541 (2)).* (Fall or spring)

217 Seminar: International Technical and Economic Assistance (3)

Technical and economic assistance activities of the United States, the United Nations, and specialized agencies; problems of law, policy, program, and administration; development planning; public and private transactions and institutions involving technical or economic assistance. (Same as Law 542 (2)).* (Fall or spring)

218 Legal Aspects of International Business Transactions (3)

U.S. law and practice, including current antitrust and tax problems; brief comparison with British and Civil Law systems; international law, foreign contracts, choice of law; currency considerations; effect of SEC laws and regulations; international trade, including GATT and reciprocal trade arrangements; sources of finance, both United States and foreign, private and public, including international organizations; and selected case studies. In addition to the regular lecturers, there will be guest lecturers in their specialties. Prerequisite: Law 303. (Same as Law 427 (2)).* (Fall or spring)

225 Seminar: Manufacturing Production (3)

D. Roman

Examination of production technology, including new manufacturing processes, materials, products, equipment, and facilities. Implications of emerging technology in managing the production function. Cases, lectures, and individual student research. Prerequisite: B Ad 181 or permission of instructor. (Spring—evening)

229 Administration of Research and Development (3)

D. Roman

Examination of technological, political, and economic factors affecting the R&D environment; operational aspects; management problems in military, governmental, and industrial organizations; project selection, resource allocation, personnel, planning and control, measurement and evaluation. (Fall—day)

231 Financial Decision Making (3)

Mock, Amling

Functions and objectives of financial management, asset management, problems of internal financial analysis, rate-of-return analysis, financial forecasting, problems of capital demand and supply. Prerequisite: Acct 115 or equivalent. (Fall—evening)

232 Seminar: Capital Resource Management (3)

Mock, Amling

Problems of capital acquisition, costs, rationing, structure; dividend policy. Prerequisite: B Ad 231. (Spring—evening)

* Students registering for B Ad 215, 217, or 218 make special arrangements with the instructor for supplementary assignments equivalent to one additional semester hour.

- 233 Seminar: International Business Finance (3)** Eldridge
Case development and analysis of problems in international business finance. Impact of the evolving international payments system on business. (Spring—evening)
- 234 Seminar: Capital Formation (3)** Eldridge
Determinants of saving and investment, timing of corporate security issues, analysis of current capital market conditions. (Fall—evening)
- 235 Financial Management (3)** Mock
Problems of financial management encountered in the organization and operation of a corporation; planning financial structure, obtaining and managing capital, issuing and placing securities, administering income, security arrangements. Primarily taught by the case method. Prerequisite: Acct 215, Mgt 201. (Spring)
- 237 Investment Analysis (3)** Dockeray, Hagauer, Amling
Analysis of specific security investments; common and preferred stocks; corporate, government, and revenue bonds; sources of information. Prerequisite: B Ad 131 or equivalent. (Fall—evening)
- 238 Seminar: Investment and Portfolio Management (3)** Dockeray, Hagauer, Amling
Research and analysis of investment problems, techniques of selection and management of various types of funds. Prerequisite: B Ad 237. (Spring—evening)
- 241 Advanced Marketing Management (3)** Lauter, Divita
Marketing management problems and policies in major decision areas of product planning, channels of distribution, advertising, personal selling, sales promotion, pricing, and development of integrated marketing programs. Tools useful in decision making. Case analysis. (Fall and spring—evening)
- 242 Seminar: Marketing Theory (3)** Lauter, Hartley
Critical review of the development of marketing thought and important marketing literature. Special and current problems and/or trends in marketing and their impact on the firm and society. Prerequisite: B Ad 241. (Spring—evening)
- 243 Seminar: Marketing Research (3)** Hartley
Research as an aid to decision making and increased efficiency in marketing, marketing research process, critical appraisal of methods and results, applications of marketing research. Cases, selected readings, and research projects. Prerequisite: a course in basic statistics. (Spring—evening)
- 246 Consumer Behavior (3)** Hartley
Consumer decision making in the market place; research in pertinent interdisciplinary studies in psychology, sociology, and other behavioral fields; present and potential applications for marketing. (Fall—evening)
- 248 International Marketing (3)** Lauter
Organization for international marketing, foreign demand analysis, product development and policies, marketing structure and trade channels, advertising and promotion problems and policies, pricing, credits and collec-

tions, and legal aspects. Emphasis on development of effective international marketing strategy. (Fall and spring—evening)

249 Seminar: Comparative Marketing (3)

Lauter

Theoretical foundation for advanced work in international business. Evaluation of domestic marketing systems of different countries with particular attention to the manner in which economic and social forces create similarities and differences in performance of the marketing function. Marketing in Western Europe, Latin America, the socialist bloc, and selected underdeveloped areas of Africa and Asia. (Spring—evening)

253 Distribution Logistics (3)

Potter

Application of the systems concept to problems of physical distribution and supply of goods. Role of logistics in the economy and the business firm, transportation rates and services, location theory and problems, customer service standards pricing, inventory control, information flow, scheduling, allocation, warehousing, traffic, and logistics system organization. (Spring—evening)

255 Seminar: International Trade I (3)

Grub, Eldridge

Research, analysis, and discussion of public and private foreign trade institutions; principles and theories of international trade; role of foreign trade and investment on U.S. balance of payments; problems and changing patterns in U.S. trade in the Western Hemisphere. Guest speakers. (Fall—day and evening)

256 Seminar: International Trade II (3)

Grub, Eldridge

Research, analysis, and discussion of international problems arising from economic integration; emphasis on European Economic Community; U.S. trade with developing nations; East-West trade problems and potential; foreign trade policy of the United States. Guest speakers. Prerequisite: B Ad 255 or permission of instructor. (Spring—evening)

257 Operation of the Multinational Firm (3)

Dickie, Grub

Analysis and discussion of problems in international business by use of the case method, including international market entry and expansion; operating policies, procedures, and problems of multinational companies; developing executives for international business. Prerequisite: advanced Master's degree standing. (Spring—evening)

258 Colloquium on International Business (3)

Grub

Primarily for doctoral students; open to Master's candidates with permission of instructor. Research on selected problems in international business with emphasis upon national and international policies regarding regionalism, trade barriers, investment incentives, international organization, foreign aid and development assistance and its relation to trade with developing nations, and trade with the Communist Bloc. (Fall—evening)

259 Comparative Business Management (3)

Lauter

Primarily for doctoral students; open to Master's candidates with permission of instructor. Comparative analysis of business practices and management systems in different countries and under different economic systems. Special attention to generic characteristics of management and of business enterprises and how these are modified in different environments. Examination of the influence of these factors on the level of economic

development, social structure, history, and culture of a country. Emphasis on seminar reports and term papers. Prerequisite: Mgt 201 or equivalent. (Spring—evening)

261 Managerial Economics I (3)

Black, Holland

Managerial applications of economic analysis. Applications of economic theory and statistics to business decisions involving demand, production, cost, profits, investments, and inventories. Prerequisite: Econ 217, Mgt 203, Stat 111 and 112; or equivalent; or permission of instructor. (Fall and spring—evening)

262 Managerial Economics II (3)

Black, Holland

Managerial applications of economic analysis. Use of economic theory and statistics in business forecasting; interpretation of economic trends and developments; analysis of governmental economic policies as they affect business. Prerequisite: Econ 218, Mgt 203, Stat 111 and 112; or equivalent; or permission of instructor. (Fall and spring—evening)

265 Seminar: Managerial Economics (3)

Black

Primarily for doctoral students. Special topics and applications of analytical tools to business decision making and policy, drawn principally from current literature. Preparation and presentation of seminar papers by students on approved topics. Prerequisite: Mgt 261, 262; or permission of instructor.

275 Seminar: Transportation (3)

J. Roman

Problems and special areas of interest in transportation. Prerequisite: B Ad 171 or permission of instructor. (Spring—evening)

279 Purchasing and Materials Management (3)

Page, Sherman

(Formerly B Ad 281 *Purchasing Principles and Practices*)

Industrial purchasing and materials management principles and practices. Organization and functions in materials management. Determination of requirements, source selection, buying practices, policies, and ethics. (Fall—day)

280 Procurement and Contracting (3)

Page, Sherman

Overview of procurement and contracting; emphasis on Federal government buying policies, practices, and procedures. (Spring—evening)

282 Government Contract Administration (3)

Page, Sherman

Surveillance over performance of contract. Rights and obligations: changes, suspension of work, default, termination for the convenience of the government, inspection, warranties, procedures for the settlement of controversies on government contracts. (Fall—day)

283 Pricing and Negotiation (3)

Page, Sherman

Scope and objectives of negotiated procurement; participation and relationships of functional elements of the organization; preparation, conduct, and recording of negotiations; analysis of contract cost, price, profit, investment, and risk; cost principles; incentives; relationship of contract type to work requirements; techniques of negotiation. Prerequisite: B Ad 280 or permission of instructor.

284 Procurement Data Management (3)

Page, Sherman

Technical data and the procurement process; organizational and functional relationships, contract controlling documentation, patent rights,

rights in data, requirements determination and the acquisition of data, Federal policies, contractor interests. Configuration management; control of changes.

- 285 Systems Procurement and Project Management (3)** D. Roman, Page
Development and procurement of major systems. Project management and the impact of this technique on the procurement process. Procurement planning—from concept formulation through contract definition, development, and manufacture. (Spring—day)

286 Government Contracts (2)

Survey of basic law underlying government procurement, basic power and limitations on Federal Government in entering into contracts, administrative and legislative policies governing these contracts, advertised and negotiated procurement procedures, forms of contracts and clauses used. (Same as Law 355) (Fall or spring)

287 Government Procurement Law (2)

Survey of the law pertaining to government procurement, including an analysis of the unique features of government contracting and a discussion of the functions of Congress, the Executive branch, and the Courts in the procurement process. (Same as Law 431) (Fall or spring)

288 Formation of Government Contracts (2)

Detailed coverage of the rules and practices followed in arriving at contracts between the Government and private parties. Comparison in depth of advertised and negotiated procurement and analysis of the techniques used in pricing and arriving at the terms of such contracts. (Same as Law 432) (Fall or spring)

289 Performance of Government Contracts (2)

Discussion of the substantive legal problems that most frequently arise during the performance of government contracts. Interpretation of specifications and the most generally used contract clauses, and analysis of the rights of the parties when performance in accordance with the terms of the contract is not obtained. (Same as Law 433) (Fall or spring)

290 Government Contract Claims and Litigation (2)

Analysis of the methods which can be used by the parties to a government contract to obtain legal relief, including detailed coverage of the disputes procedure, actions for breach of contract, and forms of equitable and extraordinary relief. (Same as Law 434) (Fall or spring)

291 Seminar: Business Management (3)

Primarily for doctoral students. Research on various phases of management as practiced in American industry. (Fall and spring—evening)

293 Business Research (3)

May be repeated once for credit. (Fall or spring)

295 Business Decision Simulation (3)

Managerial decision making in a diversified multinational firm. Students are organized into teams in a simulated competitive environment in which a complex situation is played out using computers. Prerequisite: advanced Master's or doctoral degree standing.

Eastin

Allen, Dickie

- 297 Case Studies in Business Administration (3)** Jessup, Page, Allen
Cases covering the whole range of business activity. Analysis of operational situations and policy issues. Developing and implementing solutions to managerial problems. Prerequisite: advanced Master's degree standing. (Fall and spring—day and evening)
- 298 Readings in Business (3)** Conner, Kaye
Supervised readings in selected fields within business administration. Admission by permission of instructor. May be repeated once for credit. (Fall and spring—evening)
- 299 Thesis Seminar (3)** Hartley
Examination of thesis standards, research philosophy and methodology. (Fall and spring—evening)
- 300 Thesis Research (3)** Staff
(Fall and spring)

FOURTH GROUP

- 398 Advanced Reading and Research (arr.)** Staff
Limited to students preparing for the Doctor of Business Administration general examination. May be repeated for credit. (Fall and spring)
- 399 Dissertation Research (arr.)** Staff
Limited to Doctor of Business Administration candidates. May be repeated for credit. (Fall and spring)

Chemistry

Professors S.N. Wrenn (*Emeritus*), C.R. Naeser (*Chairman*), R.C. Vincent, R.E. Wood, T.P. Perros, W.E. Schmidt, D.G. White, J.B. Levy
Associate Professors Nicolae Filipescu, Bette Barton, F.L. Minn, A.D. Britt, E.A. Caress
Associate Professorial Lecturer Abraham Schwebel
Assistant Professor D.A. Rowley
Lecturers F.C. Edmundson, C.R. Midkiff, Jr., Senta Rogers

Bachelor of Arts or Bachelor of Science with a major in Chemistry (Departmental).—The Department offers two undergraduate majors designed to give students broad training in the basic divisions of chemistry: analytical, inorganic, organic, and physical chemistry. *Major I* provides considerable concentration in chemistry. However, it permits a wider selection of electives, and thus should meet the needs of students preparing to enter medicine, dentistry, or related fields. *Major II* is intended primarily for students preparing for graduate study in chemistry or those planning to enter the chemical profession and wishing to be certified to the American Chemical Society as having met the minimum requirements for professional training. Two foreign languages are recommended for students planning to do graduate work in chemistry.

Prerequisite: the Arts and Letters or the Science curriculum, respectively, pages 78–79, including Chem 11–12 and 22 or 15–16, 51–52, 53–54; Math 31 or former 22; Phys 1, 2, 51–52.

Major I—required: the general requirements, pages 83–87, including Chem 111, 112, 113–14, 122, 134, and 141.

Major II—required: the general requirements, pages 83–87, including the German language, all requirements of Major I, except Chem 134, plus Chem 142, 235; Math 32 or former 23; one course selected from Chem 195, 207, 213, 221, 222, 234, 251, Math 111, 139, Phys 161, 165, 175, Stat 197. The student is encouraged to take Math 33 or 24 and Phys 31–32 in preparation for advanced courses and graduate work. These courses are essential to graduate work in theoretical chemistry.

Master of Science in the field of Chemistry.—Prerequisite: a Bachelor's degree with a major in Chemistry from this University, or equivalent.

Required: the general requirements, pages 91–97. The required 30 semester hours of graduate work must include Chem 213 and 221, and at least two of the following: Chem 207, 236, and 251. In addition to the above, Chem 193, 299–300, and at least 4 semester hours of advanced laboratory work are also required. Courses which may be taken to satisfy this laboratory requirement are Chem 221 and 222 (3 semester hours), 136, 155, and 156; a maximum of 2 semester hours of Chem 295 may also be applied to the laboratory requirement. Chem 156 is prerequisite to Master's thesis work in the field of organic chemistry. All graduate students are required to participate in the seminar program (Chem 291) and colloquium program. A reading knowledge examination in French, German, or Russian (German or Russian preferred) must be passed before the second half of the work is started. A student who intends to become a doctoral candidate is strongly urged to take Chem 207 as early as possible in his graduate program.

Master of Science in the field of Geochemistry (an interdepartmental degree offered by the departments of Chemistry and Geology).—Prerequisite: a Bachelor's degree with a major in Chemistry or in Geology from this University, or equivalent.

Required: the general requirements, pages 91–97, including Chem 111, 112; Geol 141, 241, 249; and Chem 213 or Geol 245. The Master's Comprehensive Examination must be taken before registration for the second half of the thesis work. A reading knowledge examination in a foreign language, approved by the Department of Chemistry or Geology, must be passed before the second half of the work is started.

Doctor of Philosophy fields of study in Chemistry: Analytical Chemistry, Chemistry of Natural Products, Inorganic Chemistry, Organic Chemistry, Physical Chemistry (Electrochemistry, Kinetics, Magnetic Resonance, Solubilities, Theoretical), and Physical Organic Chemistry (Reaction Mechanisms).—See pages 91–95, 97–99, for requirements for the degree. Cumulative examinations replace the "General Examination" requirement.

Doctor of Philosophy field of study in Geochemistry (an interdepartmental field offered by the departments of Chemistry and Geology).—See pages 91–95, 97–99, for requirements for the degree.

Bachelor of Arts in Education with a teaching field in Chemistry.—Prerequisite: the Education curriculum, page 80.

Required: the Chemistry option and professional courses on pages 107, 115–16.

Graduate Placement Examinations: All entering students in the Master's and doctoral programs in the field of Chemistry are required to take the American Chemical Society Graduate Level Placement Examinations, given by the Department of Chemistry, prior to registration in the Graduate School of Arts and Sciences. The four placement examinations (in the disciplines of analytical, organic, inorganic, and physical chemistry) are of the multiple-choice type. These tests are designed to cover the subject matter in the disciplines generally taught in modern undergraduate programs preparatory for graduate work in chemistry, and the results are used by the Department to advise the individual student in planning a program of courses which are appropriate to his background.

Registration: Before completing registration each student must obtain from the representative of the Department an assignment to lecture, recitation, and laboratory sections. The work of the junior and senior years must be approved by the Department.

FIRST GROUP

3-4 Fundamentals of Physical Science for Nonscience Majors (3-3) Barton

A year course: credit toward a degree at this University given on completion of Chem 4. Lecture (2 hours), laboratory (3 hours). Selected topics from chemistry, physics, astronomy, and geology are integrated to introduce the nonscience major to the basic methods and achievements of physical science. Laboratory fee, \$11 a semester. (Academic year—day)

11-12 General Chemistry (4-4) Staff

A year course: credit toward a degree at this University given on completion of Chem 12. Lecture (3 hours), laboratory (3 hours), recitation (1 hour). Elementary course in general chemistry, including qualitative analysis. Prerequisite: one year of high school algebra. Laboratory fee, \$18 a semester. (Offered every year: academic year—day; 1970-71 and alternate years: academic year—evening)

13 General Chemistry (4) Rowley

For School of Engineering and Applied Science students only. Lecture (3 hours), laboratory (2 hours), recitation (1 hour). Matter, atomic structure, chemical bonding; chemical equations; oxygen, hydrogen, acids, and bases; chemical equilibrium; liquid and solid states; periodic table; electrochemistry; organic chemistry. Prerequisite: Phys 2, Math 31. Laboratory fee, \$18. (Fall—day)

15-16 Intensive General and Analytical Chemistry (Honors Course) (4-4) Minn

Chem 15: lecture (3 hours), laboratory (3 hours), recitation (1 hour). Chem 16: lecture (2 hours), laboratory (6 hours), recitation (1 hour). Equivalent to Chem 11-12 and 22, but with selected topics studied in depth. Prerequisite to Chem 15: high school physics and chemistry. Prerequisite to Chem 16: Chem 15. Admission by placement test prior to registration or on basis of College Board Advanced Placement Examination. Laboratory fee, \$13 a semester. (Academic year—day)

22 Introductory Quantitative Analysis (4) Vincent

Lecture (2 hours), laboratory (6 hours). Theory and practice of quantitative analysis by classical volumetric and gravimetric methods and introduction to instrumental analysis. Prerequisite: Chem 12. Laboratory fee, \$18. (Offered every year: fall and spring—day; 1971-72 and alternate years: spring—evening)

50 Introduction to Organic Chemistry (4) Caress

Lecture (3 hours), laboratory (3 hours). A terminal course for students in related disciplines. This course does not fulfill the organic chemistry requirement for chemistry majors or premedical students. Prerequisite: Chem 12 or 16. Laboratory fee, \$12. (Fall—day)

51-52 Organic Chemistry (3-3)

Levy, Caress

A year course: credit toward a degree at this University given on completion of Chem 52. Chemistry of the compounds of carbon. Prerequisite: Chem 12 or 16. (Academic year—day and evening)

53-54 Organic Chemistry Laboratory (1-1)

Staff

Laboratory complement of Chem 51-52. Prerequisite or concurrent registration: Chem 51-52. Prerequisite to Chem 54: Chem 53. Laboratory fee, \$12 a semester. (Academic year—day and evening)

SECOND GROUP**111-12 Physical Chemistry (3-3)**

Wood

Gas Laws, chemical thermodynamics, solution chemistry, chemical equilibrium, kinetics, chemical statistics, electrochemistry, and other topics. Prerequisite to Chem 111: Chem 16 or 22; Math 31; Phys 2. Prerequisite to Chem 112: Chem 111. (Offered every year: academic year—day; 1971-72 and alternate years: academic year—evening)

113-14 Physicochemical Measurements (2-2)

Schmidt, Rowley

Laboratory complement to Chem 111-12 and 122. Prerequisite or concurrent registration for Chem 113: Chem 111. Prerequisite or concurrent registration for Chem 114: Chem 112, 113, and 122. Laboratory fee, \$18 a semester. (Academic year—day)

122 Instrumental Analysis Lectures (2)

Schmidt

Theory of instrumental methods in qualitative and quantitative analysis, determination of structure, and study of reaction mechanisms with emphasis on electroanalysis, spectrophotometry, and chromatography. Correlated with Chem 114. Prerequisite or concurrent registration: Chem 112. (Offered every year: spring—day; 1971-72 and alternate years: spring—evening)

134 Descriptive Inorganic Chemistry (2)

Rowley

Intermediate level course emphasizing the descriptive chemistry of the elements. Prerequisite: Chem 16 or 22, 52. Prerequisite or concurrent registration: Chem 111. (Fall—day)

136 Inorganic Chemistry: Preparations (2)

Perros

Application of the technique of inorganic chemistry to the preparation and purification of a list of selected substances. Prerequisite: Chem 52 and 141. Prerequisite or concurrent registration: Chem 134 or 235. Laboratory fee, \$18. (Spring—day)

141-42 Advanced Experimental Chemistry (2-2)

Rowley, Caress

Designed to provide the chemistry major with facility in experimental methods common to all disciplines of chemistry. Prerequisite: Chem 54. Prerequisite or concurrent registration: Chem 111. Laboratory fee, \$12 a semester. (Academic year—day)

155 Organic Chemistry: Preparations (2 or 3)

Wrenn

Synthesis of organic compounds and application of the technique of organic chemistry to the preparation of pure compounds, using larger amounts and greater refinements than in Chem 53-54. Prerequisite: Chem 16 or 22, 54. Laboratory fee, \$10.50 a semester hour. (Spring—evening)

156 Qualitative Organic Analysis (3) Wrenn

Lecture (1 hour), laboratory (6 hours). Identification of pure organic compounds, separation of mixtures, and identification of their components. Required of all students planning thesis work in organic chemistry. Prerequisite: Chem 16 or 22, 54. Laboratory fee, \$18. (Spring—evening)

191 History of Chemistry (2) Perros

Historical development of chemistry. Prerequisite: Chem 52. (1971–72 and alternate years: fall—evening)

193 Chemical Literature (1) Wrenn

A general course; reference work and reports. Prerequisite: Chem 16 or 22, 52. Prerequisite or concurrent registration: Chem 111. (Fall—evening)

195 Undergraduate Research (1 or 2) Staff

Research on problems approved by the Staff. May be repeated once for credit. Laboratory fee, \$7.50 a semester hour. (Fall and spring)

THIRD GROUP**203 Chemical Kinetics (2) Levy**

Rates of chemical reactions and factors influencing them. Prerequisite: Chem 52, 112. (1971–72 and alternate years)

207 Chemical Bonding (3) Barton

Application of quantum mechanics to modern chemical problems, emphasis on molecular orbital and valence bond approximations; group theory. Prerequisite: Chem 112. (Fall—day)

211–12 Physical Chemistry (2–1) Wood

Same as Chem 111–12. Admission only by departmental permission. Credit assigned upon satisfactory completion of Chem 213. (Offered every year: academic year—day; 1971–72 and alternate years: academic year—evening)

213 Chemical Thermodynamics (3) Wood

Application of thermodynamics to chemical problems. Thermochemistry, homogeneous and heterogeneous equilibria, statistical calculation of thermodynamic properties, electrochemistry. Prerequisite: Chem 112 or 212. (Fall—evening)

214 Principles of Magnetic Resonance (3) Barton

Application of magnetic resonance to chemical problems, emphasis on the close connection between theory and experiment. Reaction rates, bonding, electron densities, etc. Prerequisite: Chem 207 or permission of instructor. (1970–71 and alternate years: spring—day)

215 Quantum Chemistry (3) Minn

Postulates of quantum mechanics, exactly solvable systems, variation and perturbation approximations, atomic and molecular structure and spectra, the chemical bond. Prerequisite: Chem 207 or permission of instructor. (1971–72 and alternate years)

- 216 Statistical Mechanics as Applied to Chemistry (3)** Barton
Introduction to classical and quantum statistics designed to acquaint the student with basic principles and application of method. Prerequisite or concurrent registration: Chem 207 or permission of instructor. (1971-72 and alternate years)
- 219 Spectrochemistry (3)** Filipescu
Energetic states of molecules under the influence of electromagnetic radiation and their relation to structures and spectroscopic properties. Prerequisite: Chem 207 and 221, or permission of instructor. (1971-72 and alternate years)
- 221 Advanced Analytical Chemistry I (3)** Britt
Lecture (2 hours), laboratory (3 hours). Theory and application of recent spectrometric methods of analysis, including electrical, magnetic, and optical instrumentation. Prerequisite: Chem 122. (Spring—evening)
- 222 Advanced Analytical Chemistry II (2 or 3)** Schmidt
Lecture (2 hours), laboratory (3 hours—optional). Theory and application of electroanalysis and separations by physicochemical methods. Prerequisite: Chem 122. Laboratory fee, \$7.50. (1970-71 and alternate years: fall—evening)
- 231 Coordination Chemistry (2)** Perros
Selected topics including application of ligand field theory and molecular orbital theory to transition metal complexes, determination of stability constants, and methods for the synthesis of representative coordination compounds. Prerequisite: Chem 236. (1970-71 and alternate years: fall—evening)
- 232 The Lanthanide and Actinide Elements (2)** Perros
Comprehensive review of the physical and chemical properties of the lanthanide and actinide elements; particular emphasis on the more recent developments. Prerequisite: Chem 236. (1970-71 and alternate years: spring—evening)
- 233 Organometallic Chemistry (3)** White
Survey of organometallic compounds, emphasis on the organo derivatives of boron, aluminum, and silicon; "sandwich" compounds and the olefin and acetylene complexes of transition metals. Prerequisite: Chem 236 and 251, or permission of instructor. (1970-71 and alternate years: fall—evening)
- 234 Nuclear and Radiochemistry (2)** Schwebel
(Formerly Radiochemistry)
Preparation, properties, and uses of radioactive atoms, both natural and synthetic. Prerequisite: Chem 235. (1970-71 and alternate years: fall)
- 235-36 Advanced Inorganic Chemistry (3-3)** White
Application of modern chemical theories to inorganic substances and reactions followed by a detailed study, developed from the periodic table, of the chemistry of the more common elements. Prerequisite to Chem 235: Chem 52, 114. Prerequisite to Chem 236: Chem 235. (Academic year—day)

237 Physical Inorganic Chemistry (2)

Rowley

Quantitative application of modern theories for interpretation and explanation of the electronic properties of transition-metal complexes. Prerequisite: Chem 112 and 134, or Chem 235. (1971-72 and alternate years: spring—evening)

251-52 Advanced Organic Chemistry (3-3)

Filipescu

Synthesis, reactions, and properties of organic compounds; fundamental theories of organic chemistry, emphasis on reaction mechanisms. Prerequisite to Chem 251: Chem 52, 112. Prerequisite to Chem 252: Chem 251. (Academic year—evening)

253 Advanced Synthetic Organic Chemistry (3)

Wrenn

Study of reactions employed in the synthesis of organic compounds. Prerequisite: Chem 251. (Spring—evening)

257 Physical Organic Chemistry (2)

Levy

Physical aspects of the reactions of organic compounds; effects of structure and medium on reactivity. Prerequisite: Chem 252 or permission of instructor. (1970-71 and alternate years: spring—evening)

258 Natural Products (2)

Caress

Methods of structure determination and synthesis of naturally occurring compounds; some aspects of the chemistry of terpenes, steroids, alkaloids, etc. Prerequisite: Chem 251 or consent of instructor. (1970-71 and alternate years: spring—evening)

259 Polymer Chemistry (3)

Preparation, properties, and structure of macromolecules. Prerequisite: Chem 52, 112. (1971-72 and alternate years)

291 Seminar: Recent Developments in Chemistry (0)

Staff

All graduate students are required to participate in this seminar throughout their period of residence in the Department. No academic credit. No tuition fee required. (Fall and spring—day)

295 Research (arr.)

Staff

Research on problems approved by the Staff. Open to qualified students with advanced training. May be repeated for credit not to exceed a total of 8 semester hours. Laboratory fee, \$7.50 a semester hour. (Fall and spring)

299-300 Thesis Research (3-3)

Staff

Laboratory fee, \$18 a semester. (Academic year)

FOURTH GROUP**398 Advanced Reading and Research (arr.)**

Staff

Limited to students preparing for the Doctor of Philosophy cumulative examinations. May be repeated for credit. (Fall and spring)

399 Dissertation Research (arr.)

Staff

Limited to Doctor of Philosophy candidates. May be repeated for credit. (Fall and spring)

Chinese Language and Literature*

Associate Professor Chung-wen Shih

Assistant Professors G.C.Y. Wang, D.L. Lee

Assistant Professorial Lecturer Ming-jean Loh

Bachelor of Arts in the field of Chinese Studies.—See Public and International Affairs, page 371.

FIRST GROUP

1-2 Beginning Mandarin Chinese, Level I (3-3)

Lee

A year course: credit toward a degree at this University given on completion of Chin 2. Classroom (3 hours), laboratory (1 hour). Fundamentals of grammar and pronunciation with graded reading and practice in writing. Listening comprehension and oral practice in language laboratory. Laboratory fee, \$17.50 a semester. (Academic year—evening)

3-4 Beginning Mandarin Chinese, Level II (3-3)

Wang

A year course: credit toward a degree at this University given on completion of Chin 4. Classroom (3 hours), laboratory (1 hour). Continuation of grammar and spoken Chinese with more emphasis on the written language and reading. Aural training, oral practice in language laboratory. Prerequisite: Chin 2 or equivalent. Laboratory fee, \$17.50 a semester. (Academic year—evening)

5-6 Beginning Intensive Mandarin Chinese, Levels I-II (6-6)

Lee

Classroom (6 hours), tutorial (2 hours), laboratory (1 hour). Intensive beginners' course in fundamentals of grammar and pronunciation with graded reading and practice in writing. Listening comprehension and oral practice in language laboratory. Prerequisite to Chin 6: Chin 5 or 2. Laboratory fee, \$17.50 a semester. (Academic year—day)

7-8 Intermediate Intensive Mandarin Chinese (6-6)

Wang

Classroom (6 hours), tutorial (2 hours), laboratory (1 hour). Reading basic texts; writing short pieces; conversation; systematic review of grammar. Prerequisite to Chin 7: Chin 4 or 6. Prerequisite to Chin 8: Chin 7. Laboratory fee, \$17.50 a semester. (Academic year—day)

SECOND GROUP

103 Intensive Readings in Modern Chinese (6)

Staff

(Formerly Chin 109-10 Readings in Modern Chinese Texts)

Intensive readings in selected modern literary works, social sciences, and documentary materials. Prerequisite: Chin 8 or equivalent. (Fall—day)

105 Introduction to Classical Chinese (Intensive) (6)

Staff

Introduction to classical writing in Chinese literature, history, and philosophy. Prerequisite: Chin 4 or 6. (Spring—day)

123-24 Introduction to Chinese Linguistics (3-3)

Staff

Designed for students in the Chinese language and for students in linguistics or comparative philology. Introduction to the history of the Chinese language. Analysis of linguistics structure of modern spoken

* Administered by the School of Public and International Affairs.

Chinese and classical Chinese. Prerequisite: Chin 4 or 6, or a course in linguistics.

165 Chinese Literature in Translation (3)

Shih

Open to students who have no knowledge of the Chinese language. General survey of the development of Chinese literature from ancient times to present. Major works will be studied in terms of their historical development. (Fall—day)

167 Chinese Fiction in Translation (3)

Shih

Open to students who have no knowledge of the Chinese language. Reading of major novels, including *Romance of the Three Kingdoms*, *All Men Are Brothers*, *Golden Lotus*, *Dream of the Red Chamber*, *Scholars*, and *The Travels of Lao Ts'an*. (Spring—day)

171-72 Poetry of the T'ang and Sung Periods (3-3)

Staff

Reading of works of leading poets. Discussion of content and style. Prerequisite: Chin 103 or equivalent.

173 Yüan Drama (3)

Shih

Reading of plays by Kuan Han-ch'ing, Ma Chih-Yüan, Cheng Kuang-chu, Po P'u, and Wang Shih-fu. Prerequisite: Chin 103 or equivalent. (Fall—day)

177-78 Prose Narratives of the Sung, Ming, and Ch'ing Period (3-3)

Staff

Short stories of the Sung period. Selected readings of Ming-Ch'ing novels. Historical development and stylistic traits. Prerequisite: Chin 103 or equivalent.

179-80 20th Century Chinese Literature (3-3)

Staff

Short stories of Lu Hsün, Lao She, Shen Tsung-wen, Mao Tun, and others. Informal essays by Lu Hsün, Chou Tso-jen, and Chu Tzu ch'ing. Poetry of Wen I-to and Kuo mo-jo. Drama of T'ien Han and Ts'ao Yü. Prerequisite: Chin 103 or equivalent.

185-86 Directed Reading (3-3)

Staff

Reading of material pertaining to individual research. Admission by permission of instructor. (Academic year—day)

188 Writing Seminar (3)

Staff

Lectures and discussions on bibliography and research methods. Guided research with a paper on a specific topic in Chinese literature. Prerequisite: 9 semester hours of second-group Chinese Language and Literature courses.

Classics

Professor J.F. Latimer (Chairman)

Associate Professorial Lecturer A.B. Seidman

Assistant Professor J.E. Ziolkowski

Adjunct Assistant Professor Mary Norton

Assistant Professorial Lecturers Mary Nutting, D.B. Beers, Neil Levine

Bachelor of Arts with a major in Classical Humanities (Departmental).—Prerequisite: the Arts and Letters curriculum, page 78, including Clas 13-14, 71, 72; Hist 39-40.

Required: the general requirements, pages 83-87, including Clas 101-2, 108, 113, 125, 126; Art 102 or 111; Hist 105-6, 109, 110; Phil 111. A reading knowledge of French and German is recommended.

Bachelor of Arts with a major in Latin (Departmental).—Prerequisite: the Arts and Letters curriculum, page 78, including Hist 39-40.

Required: the general requirements, pages 83-87, and (1) 22 semester hours in Latin beyond first-group courses, including Clas 131-32, 137-38; (2) Art 111, Hist 109 or 110, Phil 111. A reading knowledge of French and German is recommended.

Bachelor of Arts with a major in Classical Archeology and Greek (Departmental).—This interdepartmental major may be arranged in conjunction with the Department of Art. Prerequisite: the Arts and Letters curriculum, page 78, including Clas 13-14, Hist 39-40.

Required: the general requirements, pages 83-87, including 12 semester hours of second-group courses in Greek; Clas 137-38; Anth 183; Art 101, 102, 103, 111; Hist 109, 110; Phil 111. A reading knowledge of French and German is recommended.

Clas 1-2 and 3-4 or 11-12 and 13-14 satisfy the foreign language requirements (see page 77). Clas 71, 72 satisfies the literature requirement in Columbian College. For students entering with two years of high school Latin, Clas 3-4 will satisfy the language requirement.

LATIN AND GREEK

FIRST GROUP

1-2 First-year Latin (3-3)

Nutting and Staff

A year course: credit toward a degree at this University given on completion of Clas 2. Functional presentation of the essentials of the language, appropriate reading selections, development of English derivatives, introduction to Roman life and literature. (Academic year—day)

3-4 Second-year Latin (3-3)

Norton

A year course: credit toward a degree at this University given on completion of Clas 4. Continuation of Clas 1-2; emphasis on Latin readings that illustrate Roman life and literature. Prerequisite: Clas 1-2 or two years of high school Latin. (Academic year—day)

11-12 First-year Greek (3-3)

Ziolkowski

A year course: credit toward a degree at this University given on completion of Clas 12. Essentials of grammar; appropriate reading selections. Text used varies between Attic and Homeric Greek. (Academic year—day)

13-14 Second-year Greek (3-3)

Ziolkowski

A year course: credit toward a degree at this University given on completion of Clas 14. Review of grammar; rapid reading from selected Greek authors. Prerequisite: Clas 12. (Academic year—day)

SECOND GROUP

101-2 Introduction to Latin Literature (3-3)

Beers

Selections from a wide variety of Latin authors of prose and poetry. Prerequisite: Clas 3-4 or equivalent. (Academic year—day)

- 103 Roman Comedy (3)** Norton
Selected plays from Plautus and Terence. Prerequisite: Clas 101-2 or permission of instructor. (Fall—day)
- 109-10 Latin Prose and Poetry of the Golden Age (3-3)** Norton
Selections from one or two major authors will be read each semester. May be repeated for credit. Prerequisite: Clas 101-2 or permission of instructor. (Clas 110 (lyric poetry): spring—day.)
- 117-18 Latin Prose and Poetry of the Silver Age (3-3)** Staff
Selections from one or two major authors will be read each semester. May be repeated for credit.
- 131-32 Latin Prose Composition (1-1)** Norton
Exercises in Latin prose composition for Latin majors. Other students may enroll by permission of instructor. (Academic year—day)
- 133-34 Medieval Latin Literature and Texts (3-3)** Andrews
Wide variety of selections in prose and poetry for rapid reading. Prerequisite: Clas 101-2 or permission of instructor. May be taken for graduate credit with permission of instructor.
- 135-36 Survey of Latin Literature (3-3)** Staff
Latin literature in historical sequence. For Latin majors. Other students may enroll by permission of instructor.
- 137-38 Introduction to Classical Studies (1-1)** Latimer
Required course for Latin or Classical Archeology and Greek majors; other students admitted with permission of instructor. Survey of the broad range of sources and resources involved in pursuing classical studies: standard references, periodicals, library holdings, papyrology, textual criticism, history of classical scholarship.
- 139 Readings in Greek Literature (1 or 2)** Ziolkowski
Selections from a wide variety of Greek prose, drama, and poetry, suited to the needs of the class. May be repeated for credit with permission of instructor. Prerequisite: Clas 14. (Fall and spring—day)
- 141 Medieval Latin (3)**
Selections from the Vulgate and representative Latin writers through the 11th century. Prerequisite: Clas 101-2 or permission of instructor. May be taken for graduate credit with approval of instructor.

COURSES IN ENGLISH TRANSLATION

FIRST GROUP

- 71 Greek and Roman Epic, History, and Biography (3)** Ziolkowski
(Formerly *Greek and Roman Epic*)
Selections from Homer, Herodotus, Thucydides, Plutarch, Livy, Tacitus, Suetonius, Vergil, and Ovid. (Spring—day)

72 Greek and Roman Poetry, Drama, Philosophy, and Satire (3)

Ziolkowski

(Formerly Greek and Roman Literature)

Selections from Pindar, Sophocles, Euripides, Aristophanes, Plautus, Terence, Plato, Epicurus, Aristotle, Zeno, Seneca, Apuleius, and Juvenal.
(Fall—day)

SECOND GROUP**108 Classical Mythology (3)**

Norton

Mythology of the Greeks and Romans from the creation of the world: tales of the gods, heroes, and great families that have influenced literature, art, and music. Prerequisite: Engl 1, 2; or equivalent. (Spring—day)

113 Greek and Roman Drama (3)

Norton

Selected masterpieces of Greek and Roman tragedy and comedy.
(Fall—day)

125 The Legacy of Greece (3)

Latimer

Study of our classical heritage from ancient Greece; emphasis on literature, art, political institutions, law, and religion. Prerequisite: Clas 71, 72; or Hist 39; or permission of instructor. (Fall—day)

126 The Legacy of Rome (3)

Latimer

Study of our classical heritage from ancient Rome; emphasis on literature, political institutions, law, and religion and their values for the modern world. Prerequisite: Clas 71, 72; or Hist 39; or permission of instructor. (Spring—day)

HEBREW

Hebrew does not satisfy the foreign language requirement for Columbian College of Arts and Sciences (see page 77).

FIRST GROUP**21-22 First-year Hebrew (3-3)**

Seidman

A year course: credit toward a degree at this University given on completion of Clas 22. Study of the elements of Hebrew; emphasis on sources of the language, reading comprehension, writing facility, and conversation. (Academic year—day)

23-24 Second-year Hebrew (3-3)

Seidman

A year course: credit toward a degree at this University given on completion of Clas 24. Review of grammar; continued development of reading comprehension, writing facility, and conversation. Selections from Hebrew text of the Old Testament and other materials. (Academic year—day)

Economics

Professors A.E. Burns, D.S. Watson, J.W. Kendrick, C.T. Stewart, Jr., C.E. Galbreath, Joseph Aschheim, R.P. Sharkey, J.L. Knetsch, Henry Solomon (*Chairman*), G.L. Mangum (*Research*), Sar Levitan (*Research*), Louis De Alessi

Adjunct Professors T.F. Carroll, Barend de Vries, Norman Ture

Professorial Lecturer John Hardt

Associate Professors Mary Holman, Ching-Yao Hsieh, R.Y.C. Yin, W.F.E. Long, S.E. Haber, R.M. Dunn, Jr.

Associate Professorial Lecturer J.M. Howell

Assistant Professors B.C. Field, J.T. Bennett, J.E. Fredland, Christopher Jehn

Adjunct Assistant Professors Henry Peskin, H.J. Cassidy

Assistant Professorial Lecturers J.N. Ellison, D.M. Heien, J.J. Horton, Jr., C.H. Stem

Lecturer T.R. Robinson

Bachelor of Arts with a major in Economics (Departmental).—Prerequisite: the Arts and Letters curriculum, page 78, including Econ 1–2.

Required: the general requirements, pages 83–87, and (1) Econ 101, 102 (to be completed no later than the junior year), and 198; (2) Econ 121 and 122, or 161 and 162, or 181–82; (3) 12 additional hours of second-group Economics courses, including Econ 121 if not previously elected, to be selected with the approval of the adviser; (4) Math 31 and 32; (5) Stat 111 and 112, or equivalent.

Master of Arts in the field of Economics.—Prerequisite: the degree of Bachelor of Arts with a major in Economics at this University, or equivalent.

Required: the general requirements, pages 91–97, including (1) Econ 203–4, 205; (2) 15 additional semester hours to be selected from other third-group Economics courses; and (3) a thesis (Econ 299–300).

Doctor of Philosophy fields of study in Economics: Econometrics, Economic Development, Economic History, Economic Policy, Economic Theory, History of Economic Thought, Industrial Organization, International Economics, Labor Economics, Mathematical Economics, Monetary Economics, National Income Accounting, Natural Resources Economics, Public Finance, Regional Economics, and Soviet Economics.—See pages 91–95, 97–99, for requirements for the degree.

Departmental prerequisite: Econ 1–2 is prerequisite to all other courses in Economics.

FIRST GROUP

1–2 Principles of Economics (3–3)

Staff

Lecture (2 hours), recitation (1 hour). Survey of the major economic principles, institutions, and problems in contemporary life. Econ 1 is prerequisite to Econ 2. (Econ 1: fall and spring—day and evening. Econ 2: fall—evening; spring—day and evening.)

SECOND GROUP

101 Intermediate Microeconomic Theory (3)

Watson, Field, Yin

Analysis of supply, demand, and pricing. (Fall—day and evening; spring—day)

- 102 Intermediate Macroeconomic Theory (3)** Holman, Yin
Theories of national income determination and growth. (Fall—day; spring—day and evening)
- 104 History of Economic Thought (3)** Hsieh
History of the major schools of economic thought, influence of changing problems on the development of economic theory. (Spring—day)
- 105 Economics Condition Analysis and Forecasting (3)** Kendrick
Theory and empirical analyses of economic trends and fluctuations, use of economic indicators and simple econometric models, workshop experience in an analysis of an aspect of the U.S. economy. (Fall—day)
- 121 Money and Banking (3)** Staff
Nature of money, credit, commercial banking, and other financial institutions in the U.S. monetary system. (Fall—day and evening; spring—day)
- 122 Monetary Theory and Policy (3)** Aschheim
Analysis of role of money in economic activity in terms of supply of and demand for loanable funds, determination of interest rates and price level. Problems of U.S. monetary policy. Prerequisite: Econ 121. (Spring—day)
- *123 Introduction to Econometrics (3)** Staff
Model construction and quantification of economic theory; relevant statistical processes and role of probability. Prerequisite: Econ 101, 102, and a one-year sequence in calculus. (Fall or spring)
- 133 Economy of the Soviet Union (3)** Hardt
Development and main features of economic life in the Soviet Union. (Fall—day)
- 134 Comparative Communist Economic Systems (3)** Hardt
Analysis of economic development and performance of the Soviet Union and other Soviet-type economies. Institutional aspects and quantitative measures of performance. (Spring—day)
- 136 Natural Resources Economics (3)** Field
Analysis of economic problems of natural resources development and utilization; including water resources development, environmental quality, recreation; planning and policy analysis with emphasis on role of non-market demands, externalities, public institutions, and benefit-cost analysis. Prerequisite: Econ 101. (Spring—day)
- 142 Labor Economics (3)** Haber
Characteristics of American labor force, operations of labor market, wage theories and practices, impact of collective bargaining, causes and characteristics of unemployment, public policies and programs. (Fall—day)
- †147 Economic History of Europe (3)** Sharkey
European economic development since the Middle Ages; emphasis on the period following the Industrial Revolution. Evolution of capitalism and its impact upon the societies of Europe.

* Interdepartmental course offered by the departments of Economics and Statistics.

† Interdepartmental course offered by departments of Economics and History.

- 157 Regional and Urban Economics (3)** Stewart
Analysis of the processes of interregional interaction, the urban hierarchy, urban structure, and policies for regional and urban development. (Spring—day)
- 158 Industrial Organization (3)** Long
Analysis of the structures and production, pricing, and related practices of industries with emphasis on their significance and on appropriate economic policies. (Spring—day)
- 161 Public Finance I (3)** Cassidy
Theoretical and institutional analysis of government expenditures, taxation, and intergovernmental fiscal relations. (Fall—day)
- 162 Public Finance II (3)** Cassidy
Theoretical and institutional analysis of fiscal policy and debt management. (Spring—day)
- 165 Economic Policy (3)** Stewart
(Formerly *Government and Business*)
Application of economic analysis to selected contemporary economic problems. (Fall—day)
- 169 Introduction to the Economy of Communist China (3)** Yin
Background, organization, and operation of the economy. Appraisal of performance and analysis of problems of development. (Fall—day)
- *179-80 U.S. Economic History (3-3)** Staff
Process of economic growth from Colonial times to the present. Development of various sectors in the economy—such as agriculture, transportation, manufacturing, and banking—and their interdependence. Econ 179: 1607-1865. Econ 180: 1865 to present. (Academic year—evening)
- 181-82 International Economics (3-3)** Aschheim, Galbreath, Dunn, Stem
Econ 181: fundamentals of the monetary theory and pure theory of international trade. Econ 182: analysis of major contemporary problems including balance of payments, international liquidity, and economic development. (Academic year—day and evening)
- 185-86 Economic History and Problems of Latin America (3-3)** Howell
Analysis of present structures and problems of Latin American economies. (Academic year—evening)
- 198 Proseminar in Economics (3)** Holman, Long
Examination of major topics in economic theory and the application of theory and analysis to policy problems. Emphasis on directed individual research which combines theoretical and empirical analysis. Open only to economics majors in their senior year. (Fall and spring)
- 199 Independent Research in Economics (3)** Staff
Under the personal direction of an instructor. Limited to economics majors with demonstrated capacity. Prior approval of instructor required. (Fall and spring)

* Interdepartmental course offered by departments of Economics and History.

THIRD GROUP

Third-group Economics courses (except 217-18) are designed for graduate students in Economics or for graduate students with prescribed prerequisites.

- 201-2 History of Economic Thought (3-3)** Burns, Hsieh
Critical analysis and interpretation of the development of economic theory from Aristotle through the 19th century. (Academic year—evening)
- 203-4 Microeconomic Theory (3-3)** Watson, De Alessi
Econ 203: theories of the consumer and of the firm. Econ 204: theories of markets. (Econ 203 and 204: fall and spring—day and evening)
- 205 Macroeconomic Theory (3)** Hsieh, Peskin
Classical, Keynesian, and modern theories of income determination and employment. (Fall and spring—evening)
- 207 Business Cycle Analysis (3)** Kendrick
Empirical analysis of American business cycles; evaluation of the methodology and findings of the National Bureau of Economic Research. Statistical tests of theories of the business cycle. (Spring—evening)
- 208 National Income (3)** Kendrick
Theory and measurement of economic aggregates within an integrated national income accounts framework, including balance sheets and wealth statements. (Spring—evening)
- 210 Economic Methodology (3)** Stewart
(Formerly Seminar in Economics)
Methodology of economics, review of selected theoretical issues in economic theory. Prerequisite: 6 semester hours of graduate courses in economic theory. (Spring)
- 215-16 Mathematical Economics (3-3)** Solomon
Formulation and application of mathematical models in economic theory. Includes applications of the calculus, differential and difference equations, matrix theory, mathematical programming, and probability theory. Prerequisite: Econ 203-4 and 205, and a one-year calculus sequence. (Academic year—evening)
- 217-18 Survey of Economics (3-3)** Watson, Holman
For graduate students in fields other than economics. Econ 217: price theory. Econ 218: income and employment theory. Not open to graduate students in Economics. (Econ 217 and 218: fall and spring—evening)
- 223-24 Monetary Theory and Policy (3-3)** Aschheim
Theory of monetary policy within the framework of contemporary American central banking. (Academic year—evening)
- 233 Seminar: Agrarian Reform and Development in Latin America (3)** Carroll
(Formerly Seminar: Land Policy Problems in Latin America)
Analysis of Agrarian reform movements and programs in the context of current development issues in Latin American countries. (Fall—evening)

234 Seminar: Evaluation of Rural Development Projects in Latin America (3) Carroll

(Formerly Seminar: *Land Policy Problems in Latin America*)

Review of criteria for the design and evaluation of rural investment projects; case studies drawn from the experience of development agencies. (Spring—evening)

237 Seminar: Economics of Natural Resources Policy (3) Knetsch, Field

Analysis of public policy problems relating to natural resources development and management. Specific topics include public investment criteria, time discounting problems, regional analysis, and project evaluation. (Fall—evening)

241-42 Labor Economics (3-3) Haber

Analysis of labor markets, theories of wages, impact of collective bargaining, causes of unemployment, public policies and programs. Academic year—evening)

243 Seminar: Manpower Policy (3) Levitan, Mangum

Developments leading to expansion of public investment in manpower resources; evaluation of goals and operations of publicly supported programs; role of federal, state, and local governments and private institutions. (Fall—evening)

251-52 Economic Development (3-3) de Vries

Theories and problems of economic growth; special attention to the underdeveloped countries. (Academic year—evening)

253 Productivity Analysis (3) Kendrick

Concepts, measurement, and analysis of productivity in business and government at aggregate and organizational levels.

257 Regional and Urban Economics (3) Stewart

Theory of location of economic activities, analysis of interregional equilibrium and dynamics of regional growth, structure and processes of urban development. (Spring—evening)

261 Welfare Economics (3) Stewart

Theories of welfare economics and their applications to public policy; analysis of selected topics in public policy. (Fall—evening)

263 Theory of Public Finance I (3) Ture

Allocation and distribution aspects of government budget policy including critical analysis of theories and principles of expenditures, taxation, and intergovernmental fiscal relations. (Fall—evening)

264 Theory of Public Finance II (3) Ture

Stabilization aspects of government budget policy: analysis of effects of fiscal policy and debt management on level of employment, prices, and rate of economic growth. (Spring—evening)

265 Economics of Regulatory Policy (3) Staff

Analysis of economic impact of government regulatory policies and practices.

- 266 Antitrust Policy (3)** Staff
 Historical background; economics of monopoly, impact of antitrust legislation and policy.
- 267 Seminar: Soviet Economy (3)** Hardt
 Development of the Soviet-type economy. Organization, policies, and problems: monetary, fiscal, production, allocative, foreign trade, economic growth. Workshop: case studies on sectoral or problem areas. Prerequisite: graduate status; Econ 101, 102, 133, and 134, or equivalent; permission of instructor. (Fall—evening)
- 268 Seminar: Economic Theory and Development in Communist Countries (3)** Hardt
 Appraisal of the Soviet-type model for economic development in the institutional framework of Soviet and other communist processes of economic development. Workshop: case studies on Eastern Europe, Chinese and other communist economies. Prerequisite: graduate status; Econ 101, 102, 133, and 134, or equivalent; permission of instructor. (Spring—evening)
- 269 Economy of Communist China I (3)** Yin
 Analysis of organization, operation, policies, and problems. Development of the economy under communism. (Fall—evening)
- 270 Economy of Communist China II (3)** Yin
 Continuation of Econ 269, examining critical problems of development. Prerequisite: Econ 269 or permission of instructor. (Spring—evening)
- *275 Econometrics I: Introduction (3)** Peskin, Heien
 Survey of applications and introduction to statistical methods for estimating economic relationships for the economist with some mathematical facility. Prerequisite: 6 semester hours of mathematical statistics and Econ 203-4 and 205, or equivalent as approved by instructor. (Fall—evening)
- *276 Econometrics II: Theory and Method (3)** Staff
 Continuation of Econ 275; emphasis on errors in variables, confluence, nonspherical disturbances, identification, and multi-equation estimation. Prerequisite: Econ 275. Recommended: a course in matrix theory. (Spring—evening)
- *277 Econometrics III: Special Topics in Econometrics (3)** Staff
 Continuation of Econ 276. Special topics on single-equation and multi-equation estimation. Prerequisite: Econ 276 or equivalent. (Fall—evening)
- 281-82 International Economics (3-3)** Dunn
 Econ 281: theory of international trade and factor movements. Econ 282: theory of balance-of-payments adjustment. (Academic year—evening)
- 285-86 Economic Development of Latin America (3-3)** Staff
 Current policies and programs, capital formation, public and private; foreign loans and investment; social and technological preconditions of investment.

* An interdepartmental course offered by the departments of Economics and Statistics.

287 Seminar: Problems in Latin American Civilization (3) Rodríguez

Interdisciplinary seminar guided by a specialist within the methodology of his chosen discipline; each student writes a report on some aspect of a key theme (i.e., Nationalism) in Latin America's experience. Admission by permission of instructor. (Spring—day)

299–300 Thesis Research (3–3)

Staff

(Academic year)

FOURTH GROUP

Fourth-group Economics courses are limited to graduate students and are primarily for doctoral candidates. They are offered as the demand requires.

312 Seminar: Price Theory (3)

Watson, De Alessi

Discussion of topics of price theory from recent journal articles.

313 Seminar: Economic Thought in the 20th Century (3)

Burns

Continuation of Econ 201–2. Principal trends in English, Continental, and American economic thought during the present century.

315 Seminar: Topics in Mathematical Economics (3)

Solomon

Intensive study of selected topics including economic activity analysis, risk and uncertainty, and other topics of current interest. Prerequisite: Econ 215–16.

321 Seminar: Monetary Theory (3)

Aschheim

Recent developments in monetary theory.

341 Seminar: Labor Economics (3)

Staff

Current problems in theory and policy.

363 Seminar: Public Finance (3)

Staff

Selected topics of current interest.

***378 Seminar: Topics in Econometrics (3)**

Peskin

A research seminar covering current econometric literature. Prerequisite: Econ 276.

†379–80 Readings in Economic History (3–3)

Sharkey

Prerequisite: the appropriate second-group preparation and consent of instructor. (Academic year—evenings)

390 Seminar: International Economic Theory (3)

Staff

Examination of recent contributions in this field.

391 Seminar: International Economic Policy (3)

Staff

Topics selected from current significant policy problems.

398 Advanced Reading and Research (arr.)

Staff

Limited to students preparing for the Doctor of Philosophy general examination. May be repeated for credit. (Fall and spring)

* An interdepartmental course offered by the departments of Economics and Statistics.

† An interdepartmental course offered by the departments of Economics and History.

399 Dissertation Research (arr.)

Staff

Limited to Doctor of Philosophy candidates. May be repeated for credit.
(Fall and spring)

Education

Professors B.S. Root, G.L. Angel, W.T. Carroll, Carol St. Cyr, Mary Ellen Coleman, H.G. Detwiler (*Chairman*), Daniel Sinick, R.E. Baker, Martha Rashid, Rodney Tillman, Anthony Marinaccio, L.H. Elliott

Professorial Lecturers J.B. Holden, W.W. Chase, W.E. Amos, A.H. Livermore, D.D. Darland

Associate Professors Leonard Nadler, Marcella Brenner, J.G. Boswell, Margaret McIntyre, C.E. Vontress, R.J. Frankie

Associate Professorial Lecturers LuVerne Walker, Beverly Heinle, Martha Ware, P.E. Arsenault, K.W. Rollins, David Iwamoto, W.W. Burke, A.C. Jensen, James Morgan, Samuel Kavruck

Assistant Professors Gloria Horrworth, C.B. Reed, Donald Linkowski, Dorothy Moore, Lawrence Winkler, Ruth Peterson

Assistant Professorial Lecturers R.J. Kubalak, Shirley McCune, J.D. Gates, Marjorie Daly, Marianne Phelps, Helena Lietwiler, Carla Heymsfeld, Anne Hoyle, Agnes Lawless, V.E. Greaver, D.B. Fleming, Jr., R.E. McNelis, B.J. Fletcher, Norma Eittington, B.J. Jenkins, D.G. Joroff, Kathryn Lumley

Instructors Evelyn Scales, G.D. Wiggs

Lecturer Helen Beals

Programs of study leading to the degrees of *Bachelor of Arts in Education*, *Master of Arts in Education*, *Master of Arts in Teaching*, *Education Specialist*, and *Doctor of Education* are offered by the School of Education (see pages 101-25).

SECOND GROUP

Educ 136, 137, 138, 139, 140, 142, 144, and 146 are special methods courses which are to be elected in the senior year by students in the secondary school curriculum after substantial preparation in the teaching fields concerned. Course requirements and hours of credit vary with license requirements. Practices of successful teachers studied; actual teaching content as found in current texts and courses of study reviewed. Prerequisite to all special methods courses: Educ 108, 123, and 131. Additional prerequisites are stated under each course.

107 Elementary School Teaching Foundations (9)

Brenner, Horrworth

Limited to students in the M.A.T. Program in Elementary Education. A block course, dealing with the content of traditional courses in educational psychology; history of education; human development, learning, and teaching; society and the school; introduction to elementary education. 135 class hours, supplemented by field experiences.

108 Human Development, Learning, and Teaching (3)

Staff

Lecture (2 hours), conference (1 hour), field work (3 hours). Principles of effective teaching based on an understanding of human development and the nature of learning. Prerequisite: Psyc 22. (Fall and spring—day and evening)

- 111 Elementary School Curriculum and Methods (15)** Moore and Staff
For seniors. Procedures in teaching mathematics, science, social studies, language arts (reading, literature, spelling, handwriting, and oral and written expression), art, music, and physical education. Observations and participation one and one-half days a week. Prerequisite: Educ 108 and 123. (Fall—day)
- 112 Educational Measurement (3)** Winkler and Staff
Scope, needs, services to students, selection and construction of teacher-made tests, interpretation of tests for evidence purposes. Prerequisite: Educ 108 and 123. (Fall and spring—day and evening)
- 113 Elementary School Art (3)** Heinle
For undergraduates in the elementary school curriculum. Materials and methods. Prerequisite: Psyc 1 and 22. Material fee, \$5. (Spring: lecture and laboratory (3 hours)—evening, field work—as arranged)
- 114 Elementary School Music (3)** Daly
Lecture (2 hours), field work (2 hours). For undergraduates in the elementary school curriculum. Materials and methods. Prerequisite: Psyc 1 and 22.
- *115 Elementary School Teaching of Reading (3)** Hoyle
Introduction to methods, techniques, materials, and activities essential to a good elementary school reading program. Prerequisite: Educ 108 and 123, or teaching experience.
- *116 Elementary School Social Studies (3)** Moore
Content, methods, materials, and activities essential in the elementary school curriculum. Prerequisite: Educ 108 and 123, or teaching experience.
- *117 Elementary School Science (3)** St. Cyr
Lecture (2 hours), field work (2 hours). Content, methods, materials, and activities essential in the elementary school curriculum. Prerequisite: Educ 108 and 123, or teaching experience.
- 119 Elementary School Curriculum (12)** Brenner and Staff
Limited to students in the M.A.T. Program in Elementary Education. A block course; reading, children's literature, communication arts, arithmetic, science, social studies, art, music, and physical education. 180 class hours, supplemented by appropriate observations and field experiences. (Fall—day)
- *120 Elementary School Mathematics (3)** St. Cyr
Content, methods, materials, concepts of "new mathematics," and activities essential in the elementary school curriculum. Prerequisite: Educ 108 and 123, or teaching experience. (Spring—evening)
- 123 Society and the School (3)** Brenner, St. Cyr, Tillman
Lecture (2 hours), conference (1 hour), field work (2 hours). Historical and social development of education at local, national, and international levels; cooperation of the school with other community agencies; functions of school personnel. (Fall and spring—day and evening)

* This course may not be taken by students who have completed or plan to enroll in Educ 111.

- *128 Children's Literature (3)** Walker, McIntyre
Newer books for children and the children's classics, contribution of literature to child development, children's original expressions. (Spring: lecture (2 hours)—evening, field work (2 hours)—as arranged)
- 130 Internship in Elementary Education (6)** Brenner, Horrworth
Limited to students in the M.A.T. Program in Elementary Education. Full-time teaching in an elementary school under cooperative supervision of the school system and the University staff. Admission by permission of instructor. Prerequisite: Educ 119 or equivalent. (Spring)
- 131 Secondary School Principles and Methods (3)** Boswell
For seniors. Classroom management and teaching techniques for initiating, guiding, and evaluating learning activities. Prerequisite: Educ 108 and 123. Field work in the public schools to be arranged. (Fall and spring—day)
- 132 Student Teaching in Early Childhood Schools (6 to 9)** McIntyre
For seniors. Admission by permission of instructor. Prerequisite: Educ 111 or equivalent. (Fall and spring)
- 133 Supervised Experience in Education (3 to 6)** Staff
(Formerly Supervised Experience in Adult Education)
Field work, internship, and instructional practice. Educ 133A: adult education and employee training (Nadler); Educ 133B: student personnel work (Kirkbride); Educ 133C: higher education (Angel). May be repeated for credit. Admission by permission of instructor. (Fall and spring)
- 134 Student Teaching in Secondary Schools (6 to 9)** Reed, Boswell, and Staff
For seniors. Sections A, B, and C are for full-time academic majors. Section D is for physical education majors. Admission by permission of instructor. Prerequisite: Educ 131. (134A: fall; 134A, 134B, 134C, and 134D: spring)
- 135 Student Teaching in Elementary Schools (6 to 9)** Moore and Staff
For seniors. Admission by permission of instructor. Prerequisite: Educ 111 or equivalent. (Fall and spring)
- 136 Teaching English in Secondary Schools (3)** McNelis
Prerequisite: 18 semester hours in English. (Spring: lecture (2 hours)—evening, field work (2 hours)—as arranged)
- 137 Teaching Speech (3)** Richards
Prerequisite: 18 semester hours in speech or permission of instructor. (Spring: lecture (2 hours)—evening, field work (2 hours)—as arranged)
- 138 Teaching Social Studies in Secondary Schools (3)** Boswell
Prerequisite: 24 semester hours of social studies. (Spring: lecture (2 hours)—evening, field work (2 hours)—as arranged)
- 139 Teaching Art in Secondary Schools (3)** Heinle
Lecture (2 hours), laboratory (2 hours). Prerequisite: 24 semester hours of Art. Material fee, \$4.50. (Spring—evening)

* This course may not be taken by students who have completed or plan to enroll in Educ 111.

- 140 **Teaching Mathematics in Secondary Schools** (3) Gates
Prerequisite: mathematics through calculus. (Spring: lecture (2 hours)—evening, field work (2 hours)—as arranged)
- 142 **Teaching Music in Secondary Schools** (3)
Prerequisite: 24 semester hours of Music.
- 144 **Teaching Science in Secondary Schools** (3) Livermore
Prerequisite: 24 to 40 semester hours of science. (Spring: lecture (2 hours)—evening, field work (2 hours)—as arranged)
- 146 **Teaching Foreign Languages** (3) Arsenault
Prerequisite: 18 semester hours of one foreign language. (Spring: lecture (2 hours)—evening, field work (2 hours)—as arranged)
- 152 **Curriculum for Early Childhood** (3) McIntyre
Admission by permission of instructor. (Spring—evening)
- 153 **Early Childhood Classroom Management** (3) McIntyre
Admission by permission of instructor. (Fall—evening)
- 154 **Community Resources for the Young Child** (3) McIntyre
Admission by permission of instructor. (Spring—late afternoon)
- *160 **Institute in Comparative Education** (3) Moore
Survey and comparison of educational plans and procedures used in selected foreign countries utilizing embassy resources. Planned to provide the classroom teacher with a deeper understanding of foreign cultures and educational systems.

THIRD GROUP

Departmental prerequisite: A degree from an accredited institution is prerequisite to all third-group courses in Education.

203-4 **Comparative Education** (3-3)

Comparison of United States with foreign educational systems, particularly those of Russia, West Germany, Denmark, Switzerland, France, the British Isles, Canada, and Australia.

*205-6 **The Curriculum** (3-3)

St. Cyr

For experienced teachers. Educ 205: curriculum foundations and issues, comparison of curriculum patterns. Educ 206: curriculum development in subject areas, group consideration of student problems. (Academic year—evening)

*207 **Curriculum Materials** (3 to 6)

St. Cyr

For experienced teachers. Construction of courses of study and classroom teaching aids, with direct application to students' situations.

*208 **Human Development** (3)

Rashid

Contribution of various disciplines to an understanding of human development throughout the life span; emphasis on practical implications of relevant research. (Fall—day; spring—evening)

* Prerequisite: adequate professional preparation.

209 Child Development (3)

Rashid

Interdisciplinary approach to child development. Analysis, interpretation, and practical implications for instruction of research in disciplines contributing to a knowledge of child development. (Fall—evening)

210 Adolescent Development (3)

Rashid

Interdisciplinary approach to adolescent growth and development. Analysis, interpretation, and practical implications for instruction of research in disciplines contributing to a knowledge of the adolescent. (Spring—evening)

***212 Educational Measurement (3)**

Basic measurement techniques; construction, selection, administration, and interpretation of objective and essay-type examinations; statistical analysis of test results; laboratory use of test instruments.

213-14 History of Education (3-3)

Greaver

Educ 213: European backgrounds of American education. Educ 214: evolution of the American school system. (Academic year—Saturday morning)

***216 Education of Slow-learning Children (3)**

Amos

Identification, nature, and needs of slow-learning elementary and junior high school children. Emphasis on diagnosis and treatment of learning difficulties.

***217-18 Philosophy of Education (3-3)**

Darland

Educ 217: to help students formulate a personal philosophy of education. Educ 218: social foundations of education—forces that shape policies and offerings of the school. (Academic year—evening)

***219 Elementary School Classroom Procedures (3)**

Baker

Current classroom practices; emphasis on planning, unit teaching, techniques in discipline; individual and group evaluation techniques, resources for learning, providing for individual differences.

***223-24 Reading Problems (3-3)**

Coleman

Elementary and secondary school reading difficulties; classroom and clinical techniques in solving reading problems. Prerequisite: one or more years of recent teaching experience. (Academic year—evening)

226 Reading in Secondary School and College (3)

Eittington

Methods, techniques, and materials necessary for developing efficient reading skills, including skills in content subjects; organizing and evaluating reading programs. (Spring—evening)

227 Basic Issues in Elementary Education (3)

Baker

Identification, definition, and analysis of some of the most important problems facing the contemporary American elementary school. (Fall—evening)

228 Instructional Areas in Elementary Education (3)

Baker

Objectives, organization, content, and teaching methods in language arts, arithmetic, social studies, science, arts and crafts, health and physical education. (Spring—evening)

* Prerequisite: adequate professional preparation.

- *229 Administration of Elementary Education (3)** Carroll
For experienced teachers and administrators. Achieving instructional objectives, organizing and servicing teaching activities, coordinating school and community life. (Fall—evening)
- 230 Intern Seminar: Elementary School Teaching (3)** Brenner, Horrworth
Limited to students in the M.A.T. Program in Elementary Education. Scheduled weekly meetings for discussion of common problems and for cooperatively planned work on areas of individual and groups needs. (Spring—Saturday morning)
- *231 Secondary School Classroom Procedures (3)** Boswell
Current classroom practices: teacher-pupil planning, group procedures, initiatory and culminating activities, individual and group evaluation techniques, teaching aids, etc.; review of recent literature.
- *232 Supervision of Elementary Education (3)** Carroll
For experienced teachers and administrators with two or more years of teaching experience. Review of modern supervisory concepts including practices in the operation of the elementary school. (Spring—evening)
- *233 Audio-visual Education (3)** Kubalak
Lecture (2 hours), laboratory (1 hour). Selection, evaluation, and use of audio-visual materials; administrative problems in care, operation, maintenance, and use of such materials and equipment. Material fee, \$7. (Spring—evening)
- *241 Education of the Gifted (3)** Amos
For classroom teachers. Nature and discovery of giftedness, provisions for the gifted in regular classes, experimental projects.
- *243 Human Relations in Education (3)** Marinaccio
(Formerly *Human Relations in the Classroom*)
Principles and practices in human relations between and among learner, teacher, other school personnel, and parents.
- 245 School and Community (3)** Angel
The school as an important member of a team of social agencies that builds the community. (Fall—evening)
- *247 Vocational Education (3)** Wiggs
Development, current conceptions, agencies involved, problems, and trends in the United States and foreign countries at secondary and post-secondary levels. (Fall—evening)
- *251 Foundations of Guidance and Personnel Services (3)** Detwiler
Introductory survey: definitions, scope, principles, historical background, organization, services, emerging trends, and issues. (Fall and spring—evening)
- 252 Organization and Administration of Guidance Services (3)** Vontress
For guidance directors, supervisors, and experienced school counselors who hope to qualify for such positions. Prerequisite: a minimum of 15 semester hours of approved graduate work in measurement and guidance. (Spring—Saturday morning)

* Prerequisite: adequate professional preparation.

253 Analysis of the Individual for Purposes of Counseling (3) Vontress
Detailed study of individual analysis and appraisal techniques. Development of systematic case study. Prerequisite: Educ 112 or equivalent. (Fall and spring—evening)

***254 The Middle School (3)**
Purposes, organization, core program, guidance, developing course of study, extra-classroom activities. (Spring—evening)

***255-56 Secondary Education (3-3)** Root
Educ 255: current proposals for improvement of secondary education.
Educ 256: current problems in each subject-matter field. (Academic year—evening)

***257 Educational and Occupational Development (3)** Vontress
Theories of career development; structure of education, training, and work in the United States; sources, forms, collection, evaluation, and dissemination of educational-occupational information. (Fall—late afternoon; spring—evening)

258 Techniques of Counseling (3) Detwiler, Vontress
Intensive study of educational and psychological processes involved in counseling interviews. Vocational, educational, and personal counseling problems. Prerequisite: 12 semester hours in testing and guidance, including Educ 253 and 257. In exceptional cases Educ 253 or 257 may be taken concurrently with 258. (Fall and spring—evening)

259 Secondary School Administration (3) Marinaccio
For experienced teachers and administrators with two years of secondary school teaching. Survey of administration including practices of the modern high school. (Fall—evening)

260 Secondary School Supervision (3) Marinaccio
For experienced teachers and administrators with two or more years of teaching experience. Review of modern supervisory concepts including practices followed in the operation of the school. (Spring—evening)

***261 Practicum in Guidance (3 to 6)** Detwiler
Supervised practical instruction. Prerequisite: graduate work in counseling. Admission by permission of Department Chairman. (Fall and spring)

263 Human Resource Development: Training and Education (3) Nadler
(Formerly Employee Development)
Concepts and purpose, historical backgrounds, emerging roles of human resource development personnel, program areas. Prerequisite: adequate professional preparation or two years of experience in training, education, and development. (Fall—evening)

264 Program Planning in Human Resource Development (3) Nadler
(Formerly Employee Development)
Training, education, and development programs for employees and non-employees. Field work with actual client system. Admission by permission of instructor. (Spring—evening)

* Prerequisite: adequate professional preparation.

- *269-70 Business Management of Schools I-II (3-3)** Marinaccio
Educ 269: philosophy, responsibilities, and functions of the business management office in public education institutions. Educ 270: practicum in educational business management. (Academic year—late afternoon)
- *271 The Teacher and School Administration (3)** Carroll, Marinaccio
Role of federal, state, and local administrative units; school finance; legal controls; school plant; public support; improving teaching conditions. (Fall—evening; spring—Saturday morning)
- *272 The Teacher and School Supervision (3)** Carroll, Marinaccio
Nature, organization, human relationships, and techniques. (Fall—Saturday morning; spring—evening)
- *273-74 Teacher Education (3-3)** Boswell
Educ 273: aims, objectives, and basic issues; study of outstanding and experimental programs. Educ 274: recruitment and selection, general education, teaching-field preparation, professional sequences, laboratory experiences. (Academic year—evening)
- *275 Seminar: School Finance (3)** Carroll
Educational financial theory, practice, and control, including methods of financing. (Fall—evening)
- *276 Seminar: Public Relations in School Administration (3)** Carroll
Purposes, gathering materials, disseminating agencies, publicity media, public participation in policy making. (Spring—evening)
- *278 School Law (3)** Ware
Sources and scope of school law; legal rights and responsibilities of teachers, pupils, and taxpayers. Other legal problems of major interest to the group. (Spring—evening)
- *279-80 Adult Education (3-3)** Nadler
Educ 279: current concepts and objectives, agencies involved, programs on all levels—international through community. Educ 280: the adult as a learner, the teacher of adults, learning-teaching activities, administration of adult education programs. (Academic year—evening)
- *283 Higher Education in the United States (3)** Angel
Development, scope, purposes, present status, programs, and trends in higher education in the United States. (Fall—evening)
- *284 Administration of Higher Education (3)** Angel
Government, organization, and administration of colleges and universities. (Spring—evening)
- *285 Student Activities (3)** Angel
Nature and purposes of selected activities—homeroom, clubs, assemblies, school publications, student council, interscholastic contest; attention to sponsorship, participation, finance, and evaluation.

* Prerequisite: adequate professional preparation.

***287-88 Clinical Study of Reading Problems (3-3)**

Coleman

For advanced students. Diagnostic and corrective work under supervision of the Reading Center. Prerequisite: Educ 223-24 or equivalent. Material fee, \$10 a semester. (Academic year—evening)

***289 Supervisory Problems in Reading (3)**

Coleman

For experienced teachers, principals, supervisors, and superintendents. Problems in planning, reorganizing, and improving the total reading program and in promoting cooperative staff effort toward increasing teaching efficiency.

290 Diagnosis and Instruction—Severe Reading Problems (3)

Peterson

For experienced teachers. Case studies of children and/or adults with severe reading problems, planning and implementing instructional programs. Admission by permission of instructor. (Fall—evening)

291 Planning the School Plant (3)

Chase

Selection of sites; evaluation of existing buildings; utilization of present facilities; adaptation to curricular needs; building, operation, and maintenance problems.

293-94 Research and Independent Study (3-3)

Staff

Individual research under guidance of a staff member. Program and conferences arranged with an instructor. (Academic year)

***295 Research Methods and Procedures (3)**

Linkowski, Rashid, Winkler

Required of all candidates for graduate degrees in Education. To be taken early in the graduate program. Prerequisite: elementary course in statistics. (Fall and spring—day and evening)

***296 Seminar: Educational Research (3)**

Linkowski, Rashid

Analysis of scientific approaches to problems in education and evaluation of the application of research techniques. Required of all candidates for the Ed.D. degree. Prerequisite: Educ 295 or equivalent. (Fall and spring—evening)

***297 Personnel Administration (3)**

Carroll

Organization and administration of personnel programs for educational institutions. Basic philosophy, principles, responsibilities, and functions.

***298 Seminar: Personnel Administration (3)**

Carroll

Research: policies, rules and regulations, staff organizations, negotiations.

299-300 Thesis Research (3-3)

Staff

Required of Master of Arts in Education candidates writing Master's theses. (Academic year)

***301 Data Processing in Education (3)**

McCarthy

Machine accounting and computer technology for counselors, teachers, and administrators.

- 316 **Curriculum Developments in Elementary School Social Studies (3 to 6)** Moore
For experienced educational personnel. Research, techniques, materials, and innovative programs relating to the effective elementary school social studies curriculum. Admission by permission of instructor.
- 317 **Curriculum Developments in Elementary School Science (3 to 6)** St. Cyr
For experienced educational personnel. Research, techniques, materials, and innovative programs relating to the effective elementary school science curriculum. Admission by permission of instructor.
- 320 **Curriculum Developments in Elementary School Mathematics (3 to 6)** St. Cyr
For experienced educational personnel. Research, techniques, materials, and innovative programs relating to the effective elementary mathematics curriculum. Admission by permission of instructor. (Spring—evening)
- 331 **Development of the Young Child (3)** McIntyre
Lecture and laboratory. Basic concepts and problems of child development; observation, behavior patterns, child study. (Fall—evening)
- *332 **Curriculum for Early Childhood (3 or 4)** McIntyre
Lecture and field. Language arts, science, mathematics, social studies, and the creative arts, emphasizing adaptation to skills and needs of the young child; review of new programs. (Spring—evening)
- 333 **Early Childhood Classroom Management (3 or 4)** McIntyre
Lecture and field. Planning, reporting, records, equipment, space use, working with parents, and survey of types of preschools. (Fall—evening)
- 334 **Community Resources for the Young Child (3 or 4)** McIntyre
Lecture and field. Use of community agency services and specialists in pertinent fields. (Spring—late afternoon)
- 335 **Practicum in Early Childhood Education (3 to 6)** McIntyre
Supervised teaching and seminar in the early childhood field. Prerequisite: Educ 331, 332, and 333; or equivalent; and permission of instructor. (Fall and spring—day)
- 336 **Practicum in Reading (3 to 6)** Coleman
Supervised experience in testing and teaching in the Reading Center. Approximately 120 class hours required for 3 semester hours of credit. Admission by permission of instructor. (Fall and spring)
- 341 **Cognitive Models and Instructions (3)** Rashid
Cognitive models (Guilford, Piaget, etc.) are analyzed as the theoretical basis for planning instructional episodes appropriate at various levels—childhood through young adulthood. (Fall—late afternoon)

* Prerequisite: adequate professional preparation.

342 Language Development (3)

Rashid

Nature of language development; role of language in the socialization process. (Spring—late afternoon)

352 Advanced Career Development (3)

Vontress

Advanced workshop for experienced counselors; theory and uses of new educational media in guidance; field study of job opportunities in area business, industry, and government agencies. Admission by permission of instructor.

***354 Counseling of Minority Groups (3)**

Vontress

Consideration of problems and approaches related to counseling cultural and racial minorities in the American society; emphasis on counseling the disadvantaged in urban areas.

355 Counseling in Groups (3)

Staff

For experienced counselors and psychologists. Peer-group relationships with emphasis on adolescent groups. Principles of group dynamics as related to interaction within groups. Techniques and practice in group counseling. (Fall—late afternoon)

356 Seminar: Guidance and the Disciplines (3)

Staff

For experienced counselors. Exploring the foundations of guidance through the disciplines of psychology, sociology, economics, anthropology, and philosophy.

357 Mental Hygiene (3)

Vontress, Sinick

Mental health problems; emphasis on needs of counselors, teachers, and others working with children and adolescents. (Fall and spring—evening)

361 Medical Aspects of Rehabilitation Counseling (3)

Sinick

Etiology, symptomology, and treatment of chronic and traumatic disorders with rehabilitation counseling implications. Admission by permission of instructor. (Fall—day)

362 Client Evaluation in Rehabilitation Counseling (3)

Sinick

Test and nontest methods of furthering client and counselor understanding. Prerequisite: Psyc 131. (Spring)

363 Psychosocial Aspects of Rehabilitation Counseling (3)

Linkowski

Impact of congenital and later disabilities on attitudes, self concepts, and motivations. Implications for rehabilitation counseling. Admission by permission of instructor. (Fall—day)

365-66 Field Work in Rehabilitation Counseling (3-3)

Sinick

Field work of one full day a week. Educ 365: concurrent seminar covering history, philosophy, and introduction to practices. Educ 366: concurrent seminar covering job analysis, placement, and follow-up. Prerequisite to Educ 366: Educ 365. Admission by permission of instructor. (Academic year)

* Prerequisite: adequate professional preparation.

- 367-68 **Internship: Rehabilitation Counseling (6-6)** Linkowski
Supervised practice of three full days a week, with seminar providing integration of theory and practice. Prerequisite: Educ 365-66. (Academic year)
- 369 **Professional Issues in Rehabilitation Counseling (3)** Sinick
Culminating seminar covering professional problems and ethical issues. Prerequisite: Educ 367. (Spring)
- 371 **Principles and Methods of College Teaching (3)** Frankie
General principles, methods, techniques, and experimental instructional media for teaching at the college and university level. (Fall—evening)
- 372 **Internship in College Teaching (3 to 6)** Staff
Supervised experience in a selected area of college teaching. Prerequisite: Educ 371. Admission by permission of instructor. (Spring)
- 373 **The Junior-Community College (3)** Frankie
Development, organization, curriculum, role, issues, and problems of the junior-community college. (Fall—evening)
- 374 **Current Issues in Higher Education (3)** Elliott, Angel
Investigation of current issues in higher education. (Spring—evening)
- *375 **Introduction to Student Personnel Work (3)** Kirkbride
Student personnel services in American higher education. Personnel work as an integral part of the college program; introduction to the literature of the field. (Fall—day)
- *376 **Student Personnel Work with College Groups (3)** Kirkbride
Principles and procedures of personnel work with campus groups. Promotion, limitation, and coordination of campus group activities; development of student leadership. (Spring—day)
- 377 **Practicum in Student Personnel Work (3)** Phelps
Supervised practical experience in student personnel services. Admission by permission of instructor. (Fall and spring)
- 378 **Practicum in Teacher Education (3 to 6)** Brenner, Boswell
For selected, experienced teachers. Supervised practical experiences in interpersonal relationships in the school setting. Correlated research and reporting. Field work relevant to student's professional needs, to be arranged. (Spring—day)
- 379 **Practicum in Adult Education (3 to 6)** Nadler
Supervised practical experience in various forms of adult education. May be repeated for credit. Admission by permission of instructor. (Fall and spring)
- 380 **Sensitivity Training: Laboratory Method (3)** McCune
A sensitivity learning experience in human relations using unstructured group experience, individual feedback, experimentation, and practice. Admission by permission of instructor. (Fall and spring—evening)

* Prerequisite: adequate professional preparation.

381 The Adult as a Learner (3)

Psychology of learning as applied to adults; effect of age on learning; physical and social environment in adult education situations. (Fall—evening) Wiggs

382 Methods in Adult Education (3)

Methods, techniques, and devices in adult education; traditional methods, developing action-oriented learning situations, programmed instruction, and systems approach in developing training materials. (Fall—evening)

383 Counseling of Adults (3)

Concepts and practices with particular emphasis on the needs of adults in work situations. (Spring—evening) Vontress

384 Evaluation of Adult Education (3)

Measurement and evaluation of adult education in school and nonschool agencies—business, industry, government, voluntary, and community. (Spring—evening)

386 Current Issues in Adult Education (3)

Investigation of current issues in adult education. (Spring—evening) Holden

387 Administration of Adult Education (3)

Program planning, staff development, fiscal operations, facilities, and maintenance of effective community relations. (Spring—evening) Staff

391 College and University Curriculum (3)

Development, patterns, creative design, issues, problems, evaluation, and trends in the higher education curriculum. (Fall—evening) Angel and Staff

392 Financing Higher Education (3)

Analysis of private, state, and Federal revenue sources; student income, budgets, computation of unit costs, means of supporting legislative and Federal request, and measurement of economic returns. (Spring—evening) Angel and Staff

393 Practicum in Higher Education (3 to 6)

Supervised field experiences in higher education; reports and conferences. Admission by permission of instructor. (Fall and spring) Angel

FOURTH GROUP

A Master's degree from an accredited institution is prerequisite to all fourth-group courses. All seminars listed in the fourth group are open to doctoral candidates or other post-Master's degree students with approval of instructor. Study is individually planned on the basis of previous study and experience in the subject field to attain an advanced level of competence and meet identified professional needs or field requirements in a doctoral program.

Each of the following courses is offered fall and spring. Each course may be repeated for credit.

401 Seminar: History of Education (arr.)**403 Seminar: Philosophy of Education (arr.)****405 Seminar: Human Growth and Development (arr.)**GreaverRashid

- 411 Seminar: Elementary Education (arr.) Baker
 413 Seminar: Secondary Education (arr.) Root
 421 Seminar: Adult Education (arr.) Nadler
 422 Seminar: Higher Education Administration (arr.) Angel, Marinaccio
 423 Seminar: Higher Education (arr.) Angel
 424 Seminar: Personnel Work in Higher Education (arr.) Kirkbride
 425 Seminar: Teacher Education (arr.) Boswell, Baker
 427 Seminar: Employee Development (arr.) Nadler
 429 Seminar: Educational Personnel Administration (arr.) Carroll
 431 Seminar: Administration (arr.) Carroll, Marinaccio
 433 Seminar: Supervision (arr.) Carroll, Marinaccio
 434 Seminar: Elementary Supervision (arr.) Carroll
 435 Seminar: Elementary Administration (arr.) Carroll
 436 Seminar: Secondary Supervision (arr.) Marinaccio
 437 Seminar: Secondary Administration (arr.) Marinaccio
 441 Seminar: Curriculum (arr.) St. Cyr
 443 Seminar: Guidance and Counseling (arr.) Detwiler, Vontress
 445 Seminar: Research and Evaluation (arr.) Rashid, Linkowski
 491 Dissertation Research (arr.) Staff
 Preparation of a research outline; research and writing of an approved doctoral dissertation under the direction of major adviser and dissertation committee.

English

Professors C.D. Linton, C.W. Cole, R.H. Moore, J.H. Coberly, P.H. Highfill, Jr., J.G. Allee, Jr., J.P. Reesing, Jr., Milton Crane, E.R. Weismiller
 Adjunct Professor J.C. Broderick
 Associate Professors W.L. Turner, Muriel McClanahan, Elizabeth Wright, R.N. Ganz, Jr., G.E. McCandlish (Chairman), A.E. Claeysens, Jr., R.C. Rutledge
 Assistant Professors J.A. Quitslund, Margaret Sullivan, Barbara Dunham, J.W. Claiborne, Fredrica Rosenberg, Judith Plotz
 Assistant Professorial Lecturer J.J. Monroe
 Instructors Mary Walden, Diane Weber, Margaret Bonney, Nancy Bunge, Catherine Cook, Evelyn Lynch, Janet Collins, R.L. Dabney, Alice Digilio, Hazel Eagle, C.W. Sten
 Lecturers Edgar Boling, Jr., J.A. Javens, Olivia Rivers, Leah Douthitt, Alice Rice, Elna Broffman, M.M. Feick, Jean Gladding, D.R. Janis, Nancy Schick,

Mary Cherry, R.J. Fonte, Joan Gimlin, Geraldine Johnson, Carol Poston, Michelle Shwartz, Mary Turner, V.C. Wall, Jr., P.A. Woodard

Bachelor of Arts with a major in American Literature (Field-of-Study).—Prerequisite: the Arts and Letters curriculum, page 78.

Required: the general requirements, pages 83–87, and the passing of the American Literature major examination at the end of the senior year.

The field of coordinated knowledge upon which the student will be examined at the end of his senior year includes both American and English literature, but with an emphasis on American literature (the history of the literature; the chief writers; and a reasonable acquaintance with the social, political, and intellectual backgrounds). A proseminar, Engl 199–200, assists students in preparing for the major examination. A maximum of 6 semester hours of second-group composition courses (Engl 101, 102, 103, 105–6, 107, and 108) may be applied toward a degree by students majoring in American Literature. A detailed description of the major is available in the Office of the Dean of Columbian College of Arts and Sciences.

Bachelor of Arts with a major in English Literature (Field-of-Study).—Prerequisite: the Arts and Letters curriculum, page 78.

Required: the general requirements, pages 83–87, and the passing of the English Literature major examination at the end of the senior year.

The field of coordinated knowledge upon which the student will be examined at the end of his senior year includes both English and American literature, but with an emphasis on English literature (the history of the literature; the chief writers; and a reasonable acquaintance with the social, political, and intellectual backgrounds). A proseminar, Engl 159–60, assists students in preparing for the major examination. A maximum of 6 semester hours of second-group composition courses (Engl 101, 102, 103, 105–6, 107, and 108) may be applied toward a degree by students majoring in English Literature. A detailed description of the major is available in the Office of the Dean of Columbian College of Arts and Sciences.

Master of Arts in the field of American Literature.—Prerequisite: the degree of Bachelor of Arts with an undergraduate major in English, or 24 semester hours in English and/or American literature above the sophomore level.

Required: the general requirements, pages 91–97, including (1) 24 semester hours of course work planned in consultation with the adviser on the basis of the student's undergraduate preparation, including a minimum of 6 semester hours in English literature; (2) a written Master's Comprehensive Examination; (3) a Master's thesis (6 semester hours) written upon an approved topic under the direction of the instructor in whose field the major portion of the material falls.

Master of Arts in the field of English Literature.—Prerequisite: the degree of Bachelor of Arts with an undergraduate major in English or American Literature at this University, or 24 semester hours in English and/or American literature above the sophomore level. The student who has not passed the major examination in English or American Literature at this University must take a candidacy examination which, in its scope and difficulty, is comparable to the major examination in English or American Literature.

Required: the general requirements, pages 91–97, including (1) 24 semester hours of course work, planned in consultation with the adviser; (2) a written Master's Comprehensive Examination; and (3) a Master's thesis (6 semester hours) written upon an approved topic under the direction of the instructor in whose field the material falls.

Doctor of Philosophy fields of study in American Literature.—The Department of English offers the following fields for the General Examination: (1) *Early American Literature—to 1815*; (2) *American Fiction*; (3) *American Poetry*; (4) *American Romanticism, 1865–1900*; (5) *English Literature*—one of the first seven fields listed below under "English Literature." Each student plans his program in consultation with a departmental committee. See pages 91–95, 97–99, for requirements for the degree.

Doctor of Philosophy fields of study in English Literature.—The Department of English offers the following fields for the General Examination: (1) *Beginnings to 1500, Linguistics, and History of the Language*; (2) *1500–1660*; (3) *1660–1800*; (4) *1800–1900*; (5) *1900 to Present*; (6) *Drama, including Shakespeare*; (7) *Criticism*; (8) *American Literature*—one of the first four fields listed above under “American Literature.” Each student plans his program in consultation with a departmental committee. See pages 91–95, 97–99, for requirements for the degree.

Bachelor of Arts in Education with a teaching field in English.—Prerequisite: the Education curriculum, page 80.

Required: the English option and the professional courses listed on pages 108–9, 115–16.

Students whose College Board English Composition Achievement Test scores suggest inadequate preparation may be assigned to Engl 1x or may be tested in vocabulary, spelling, grammar, standard usage, and writing skill, before placement in either Engl 1x or 1. Students whose scores indicate marked superiority will be allowed to waive the Engl 1 requirement.

All students enrolled in curricula leading to Bachelor's degrees in Columbian College (who are required to take one year of English composition and one year of literature in English, Classics, French, German, Italian, Slavic, or Spanish) will follow the sequence of Engl 1 or 1x, both semesters of one of the introductory literature courses, and Engl 40.

Engl 2 is the second half of the 6-hour composition requirement of students not required to follow the Columbian College of Arts and Sciences sequence.

Departmental prerequisite: Engl 1 or 1x is prerequisite to all other courses in English. One of the following 6-hour courses—Engl 51–52, 71–72, or 91–92; Clas 71–72; Fren 51–52; Germ 51–52; Ital 51–52; Slav 91–92; or Span 51–52—is prerequisite to all second-group courses in English except Engl 115 and Engl 161–62.

ENGLISH COMPOSITION

FIRST GROUP

A English for Foreign Students (3) Wright and Staff

Reading and writing to assist the foreign student in overcoming deficiencies in the use of English. Special attention to spelling, syntax, grammar, idiom, and vocabulary. (Fall and spring—evening)

B English for Foreign Students (3) Wright and Staff

For second-semester foreign students not ready for Engl 1. Writing of expository paragraphs and themes; outlining; reading for comprehension, vocabulary, and style. (Fall and spring—evening)

1 English Composition (3) Moore and Staff

Analysis and practice of expository techniques with emphasis on unity, development, organization, and coherence; library research procedure. (Fall and spring—day and evening)

1x English Composition (3) Moore and Staff

Intensive course in English grammar and composition for students inadequately prepared for Engl 1. Begins with detailed instruction, drill, and exercises in basic structure of the English language and in writing paragraphs; continues with content of Engl 1. Engl 1x meets five hours a week and carries 3 semester hours of credit. Total fee, \$229 (tuition fee of

\$204 plus additional fee of \$25). (Fall—day and evening; spring—
evening)

2 English Composition (3)

Moore and Staff

For second-semester freshmen not following Columbian College sequence. Readings and practice in expository and argumentative techniques; research practice. Credit not given to students with credit for Engl 40. Prerequisite: Engl 1 or 1x. (Fall and spring—day and evening)

40 English Composition (3)

Moore and Staff

Second half of the 6-hour English Composition course required of Columbian College students. Critical analysis and practice in expository and argumentative techniques; research practice. Credit not given to students with credit for Engl 2. Prerequisite: Engl 1 or 1x and both semesters of one of the introductory literature courses. (Fall and spring—day and evening)

SECOND GROUP

A maximum of 6 semester hours of second-group composition courses may be applied toward a degree by undergraduates majoring in American or English Literature.

101 Expository Writing (3)

McClanahan, Moore

(Formerly Engl 109)

Types of expository writing; weekly exercises based on students' needs; particular attention may be given to problems in the writing of graduate theses. Prerequisite: Engl 1 or 1x; 2 or 40. (Fall—day)

102 Narrative Writing (3)

Claeysens

(Formerly Engl 113)

Techniques of narrative writing; class criticism of student writing. Prerequisite: Engl 1 or 1x; 2 or 40; consent of instructor. To apply for the instructor's consent a student should, before registration, submit samples of his writing. (Fall and spring—evening)

103 The Writing of Fiction—the Short Story (3)

Weismiller

(Formerly Engl 114)

Prerequisite: Engl 102, consent of instructor. To apply for the instructor's consent a student should, before registration, submit a sample of his writing. (Fall—day)

105-6 The Writing of Plays (3-3)

Claeysens

(Formerly Engl 115-16)

Prerequisite: Engl 1 or 1x; 2 or 40; consent of instructor. To apply for the instructor's permission a student should, before registration, submit a sample of his writing.

107 The Writing of Fiction—the Novel (3)

Claeysens

(Formerly Engl 118)

Prerequisite: Engl 102 or 103, consent of instructor. To apply for the instructor's consent a student should, before registration, submit a sample of his writing.

108 The Writing of Poetry (3)

Weismiller

(Formerly Engl 120)

Prerequisite: Engl 1 or 1x; 2 or 40; consent of instructor. To apply for the instructor's permission a student should, before registration, submit a sample of his writing. (Spring—day)

ENGLISH LITERATURE**FIRST GROUP****51-52 Introduction to English Literature (3-3)**

Dunham and Staff

Historical survey. Prerequisite: Engl 1 or 1x. (Engl 51: fall—day and evening; spring—day. Engl 52: fall—day; spring—day and evening.)

91-92 Introduction to European Literature (3-3)

Crane and Staff

Consideration of various types. Prerequisite: Engl 1 or 1x. (Engl 91 and 92: fall and spring—day)

SECOND GROUP**111 Medieval English Literature—Exclusive of Chaucer (3)**

Allee

*(Formerly Engl 121)***112 Chaucer (3)**

Allee

(Formerly Engl 122)

(Spring—evening)

115 Introduction to English Linguistics (3)

Allee

(Formerly Engl 125)

Development of the English language in a historical treatment of English grammar. (Fall—evening)

116 Medieval Legend and Saga (3)

Allee

(Formerly Engl 192)

Celtic and Norse.

117 English Poetry: Form and Content (3)

Weismiller

(Replaces former Engl 127-28)

Medieval period to the 20th century. (Fall—day)

123 Principles of Literary Criticism (3)*(Formerly Engl 195)***125-26 Elizabethan Verse and Prose (3-3)**

Quitslund

(Replaces former Engl 129)

Engl 125: survey of nondramatic literature. Engl 126: detailed study of major writers and genres. (Academic year—day)

127-28 Shakespeare (3-3)

Highfill, Crane

(Formerly Engl 135-36)

(Academic year—day and evening)

129 The Earlier 17th Century (3)

Reesing, Linton

(Formerly Engl 139 The 17th Century)

Poetry and prose to 1660, exclusive of Milton. (Fall—day)

- 130 **Milton** (3) Reesing, Linton, Weismiller
 (Formerly Engl 140 *The 17th Century*)
 (Spring—day)
- 131–32 **English Literature, 1660–1780** (3–3) Highfill
 (Formerly Engl 141–42)
 Poetry and prose of the Neoclassic period. Engl 131: 1660–1740. Engl 132: 1740–1780. (Engl 131: fall—day)
- 133–34 **The Romantic Movement** (3–3) Plotz
 (Replaces former Engl 151)
 Engl 133: survey of poetry and prose, 1780–1830. Engl 134: detailed study of major writers and genres. (Engl 133: spring—day)
- 135–36 **Victorian Literature** (3–3) Claiborne
 (Replaces former Engl 162)
 Engl 135: survey of poetry and prose, 1830–1900. Engl 136: detailed study of major writers and genres. (Academic year—day)
- 137–38 **The 20th Century** (3–3) Linton
 (Formerly Engl 165–66)
 British poetry, prose, and drama since 1900. (Academic year—day)
- 152 **Introduction to Contemporary Poetry** (3)
 Study of works by representative contemporary poets, with particular attention to the mythic tradition in poetry.
- 153–54 **The English Novel** (3–3) Coberly, Claiborne
 (Formerly Engl 181–82)
 Major novelists, 18th and 19th centuries. (Engl 154: spring—day)
- 155–56 **The English Drama** (3–3) Highfill, Crane
 (Formerly Engl 183–84)
 Engl 155: principally the drama of Shakespeare's contemporaries. Engl 156: historical survey, 1660 to present. (Engl 155: fall—day)
- 159–60 **Proseminar in English Literature** (3–3) Weismiller and Staff
 (Formerly Engl 199–200)
 For English Literature majors. Readings, conferences, and group discussions. (Academic year—day)

THIRD GROUP

- 212 **Studies in Chaucer** (3) Allee
 (Formerly Engl 222)
- 213–14 **Old English** (3–3) Allee
 (Formerly Engl 223–24)
 English language and literature before 1100. Engl 213: Old English grammar and readings. Engl 214: *Beowulf*. (Academic year—evening)
- 217 **English Poetry: the Formal Development** (3) Weismiller
 (Formerly Engl 227)
 (Fall—evening)

- 218 **Form and Content in Modern Poetry** (3) Weismiller
(Spring—evening)
- 219 **Research Methods and Bibliographical Materials** (3) Broderick
(Formerly Engl 279)
To acquaint graduate students with the principal sources of bibliography
and the typical problems in research. (Fall—evening)
- 220 **Studies in Modern Dramatic Literature** (3) Crane
(Formerly Engl 292)
- 221 **Studies in Comic Literature** (3) Crane
(Formerly Engl 291)
- 223-24 **Studies in Literary Criticism** (3-3)
(Replaces former Engl 295-96 and 297-98)
- 225-26 **Studies in 16th Century English Literature** (3-3) Quitslund
(Formerly Engl 229-30 *Studies in Elizabethan Nondramatic Literature*)
- 227-28 **Studies in Shakespeare and His Contemporaries** (3-3) Crane
(Formerly Engl 235-36)
- 229 **Studies in English Literature, 1600-1660** (3) Reesing
(Formerly Engl 239 *Studies in 17th Century Literature*)
Chief figures exclusive of Milton. (Fall—day)
- 230 **Studies in Milton** (3) Reesing
(Formerly Engl 240 *Studies in 17th Century Literature*)
(Spring—day)
- 231-32 **Studies in English Literature, 1660-1780** (3-3) Highfill
(Formerly Engl 241-42)
- 233-34 **Studies in the Romantic Movement** (3-3) Plotz
(Formerly Engl 251-52)
- 235-36 **Studies in Victorian Literature** (3-3)
(Formerly Engl 261-62)
- 237-38 **Studies in 20th Century Literature** (3-3) Linton
(Formerly Engl 265-66)
- 253-54 **Seminar: the English Novel** (3-3) Coberly
(Formerly Engl 293-94)
- 255-56 **Studies in Dramatic and Theatrical History** (3-3) Highfill
(Formerly Engl 283-84)
- 299-300 **Thesis Research** (3-3) Staff
(Academic year)

FOURTH GROUP

- 398 **Advanced Reading and Research** (arr.) Staff
Limited to students preparing for the Doctor of Philosophy general ex-
amination. May be repeated for credit. (Fall and spring)

399 Dissertation Research (arr.)

Staff

Limited to Doctor of Philosophy candidates. May be repeated for credit.
(Fall and spring)

AMERICAN LITERATURE**FIRST GROUP****71-72 Introduction to American Literature (3-3)**

Cole and Staff

Historical survey. Engl 71: from beginnings to the Civil War. Engl 72:
from the Civil War to present. Prerequisite: Engl 1 or 1x. (Engl 71
and 72: fall and spring—day and evening)

SECOND GROUP**161-62 Studies in American Literature (3-3)**

McCandlish

(Formerly Engl 171-72)

Same as AmCv 161-62. Major factors in the national cultural tradition
as shown by outstanding writers. Prerequisite: Engl 51-52 or 71-72.
(Academic year—day and evening)

163-64 Major American Poets (3-3)

Ganz

(Formerly Engl 173-74)

Advanced critical study of significant writers and movements. Engl 163:
from beginnings through the 19th century. Engl 164: the 20th century.
(Academic year—evening)

165-66 American Drama (3-3)

Cole, Claeysens

(Formerly Engl 175-76)

Historical and critical study of significant plays and forms. Engl 165:
from beginnings to 1930. Engl 166: since 1930. (Academic year—
day)

167-68 The American Novel (3-3)

Coberly

(Formerly Engl 177-78)

Historical and critical study of significant novels. Engl 167: from begin-
nings through the 19th century. Engl 168: 20th century. (Academic
year—day)

170 The American Short Story (3)

Coberly

Historical development of the short story in America.

171-72 Major American Writers (3-3)

Claeysens

(Academic year—evening)

173-74 Selected Literary Movements (3-3)**175-76 Special Topics in American Literature (3-3)**

Claeysens

177-78 Contemporary American Literature (3-3)

(Academic year—day)

199-200 Proseminar in American Literature (3-3)

Ganz and Staff

(Formerly Engl 179-80)

For American Literature majors. Readings, conferences, and group discus-
sions. (Academic year—day and evening)

THIRD GROUP

- 219 **Research Methods and Bibliographical Materials** (3) Broderick
(Formerly Engl 279)
 To acquaint graduate students with the principal sources of bibliography and the typical problems in research. (Fall—evening)
- 263-64 **Studies in American Poetry** (3-3) Ganz
(Formerly Engl 273-74)
- 267-68 **Seminar: American Fiction** (3-3) Coberly
(Formerly Engl 277-78)
 Research and critical reading: fiction and the criticism of fiction. Engl 267: Henry James. Engl 268: Faulkner. (Academic year—evening)
- 270 **Seminar: the American Short Story** (3) Coberly
- 281-82 **Seminar: American Colonial Literature** (3-3) McCandlish
(Formerly Engl 285-86)
 Same as AmCv 281-82. (Engl 281: fall—day)
- 283 **Studies in American Transcendentalism** (3) Broderick
(Formerly Engl 280)
 (Spring—evening)
- 284 **Seminar: American Literature, 1865-1900** (3) McCandlish
(Formerly Engl 271)
 Intensive study of works of Twain, Howells, Henry James, Norris, and Stephen Crane.
- 299-300 **Thesis Research** (3-3) Staff
(Formerly Engl 289-90)

FOURTH GROUP

- 361-62 **Readings in American Literature** (3-3) McCandlish
 Limited to those students preparing for the Doctor of Philosophy general examination whose fields of study include American Literature. (Engl 362: spring—day)
- 367-68 **Readings in American Fiction** (3-3) Coberly
(Formerly Engl 387-88)
 For graduate students only. Literature and the critical materials for which graduate students are responsible on the Doctor of Philosophy general examination. (Academic year—evening)
- 381-82 **Readings in American Colonial Literature** (3-3) McCandlish
(Formerly Engl 385-86)
 Same as AmCv 381-82. For students preparing for the Doctor of Philosophy general examination.
- 398 **Advanced Reading and Research** (arr.) Staff
 Limited to students preparing for the Doctor of Philosophy general examination. May be repeated for credit. (Fall and spring)
- 399 **Dissertation Research** (arr.) Staff
 Limited to Doctor of Philosophy candidates. May be repeated for credit. (Fall and spring)

Epidemiology and Environmental Health

Professors J.W. Millar (*Chairman*), J.A. Halsted (*International Health*)

Associate Professor C.R. Hartman

Associate Clinical Professors David Frost, W.J. Zukel

Assistant Professors M.E. Landay, E.N. Kassira, H.A. Bradford

Assistant Clinical Professors Lawrence Pyle, Jr., John Vinyard, Jr.

Assistant Professorial Lecturers S.H. Barboo, Jr., C.H. Miller, N.E. Manos

Master of Science in the field of Mycology.—An interdepartmental degree offered by the departments of Biochemistry, Epidemiology and Environmental Health, and Microbiology.

Prerequisite: a Bachelor's degree with a major in Biology, Botany, Chemistry, or Zoology, from this University; or equivalent. The undergraduate program should have included the following courses, or equivalent: B Sc 11-12; Chem 11-12, 51-52, 53-54.

Required: the general requirements, pages 91-97. The 33 semester hours required in this program must include Bioc 221-22; Epid 201, 217, 230; Micr 201, 225, 231; and *Thesis Research* (299-300).

Doctor of Philosophy field of study in Human Ecology.—See pages 91-95, 97-99, for requirements for the degree.

201 Introduction to Epidemiology and Environmental Health (2)

Millar and Staff

Required for medical students; open to qualified graduate students. Principles and methodology of epidemiology and biostatistics. Ecological approach to health and disease, including parasitology and mycology. (Spring—day)

217 Advanced Mycology (4)

Landay (Fall)

Advanced study of fungi. Prerequisite: Micr 201 or equivalent. —day

218 Advanced Parasitology (1 or 2)

Millar

For medical students; open to qualified graduate students. host-parasite relationships, including laboratory procedures. (Fall—day)

Study of

219 Malariology (1)

Staff

Ecology, laboratory, and public health aspects of malaria. (Fall)

230 Biostatistics (2)

Bradford, Manos

Application of statistical methods to health-related problems. Prerequisite: elementary college algebra. (Fall—day)

295 Research in Epidemiology (arr.)

Staff

Participation in experimental studies in infectious diseases and research in community medicine. Admission by permission of Department. (Fall and spring)

301 Epidemiology and Environmental Health (1)

Staff

Lectures and seminars. Emphasis on means of organizing community to provide epidemiological solutions to health problems, developing an awareness of health resources and significant socioeconomic considerations in bringing total health to the community, showing importance of health as

related to individual citizens. World health problems. Prerequisite: Micr 201 or equivalent. (Spring—day)

- 351 **Global Epidemiology (1)** Staff
Geographic pathology of disease and international aspects of disease prevention and control, including world demographic problems. (Fall—day)

- 352 **Seminar: Experimental Epidemiology (1)** Staff
For medical students; open to graduate students by arrangement. Student participation in definitions, design, and methods for developing epidemiologic studies of diseases. Coordinated so that protocol developed can be applied to field use. (Fall—day)

- 353 **Military Preventive Medicine (1)** Millar
Operational medicine, environmental and sanitation problems, epidemiologic diseases of military importance and their prevention and control. Medical aspects of aerospace and submarine medicine. (Fall—day)

- 398 **Advanced Reading and Research (arr.)** Staff
Limited to students preparing for Doctor of Philosophy general examination. May be repeated for credit. (Fall and spring)

- 399 **Dissertation Research (arr.)** Staff
Limited to Doctor of Philosophy candidates. May be repeated for credit. (Fall and spring)

Forensic Science—Graduate Study

Director of the Program W.F.E. Long

COMMITTEE ON FORENSIC SCIENCE

T.P. Perros (*Chairman*), A.H. Desmond, H.H. Hobbs, R.L. Holland, J.E. Starrs

The Graduate School of Arts and Sciences offers an interdisciplinary program leading to the degree of Master of Science in Forensic Science. Emphasis is placed on science and law. A Bachelor's degree with a major in mathematics, or in the biological, engineering, or physical sciences, is required for admission to the program. The general requirements for the Master's degree in the Graduate School apply to this program, see pages 91-97. The program of study consists of 36 semester hours of graduate-level courses, and does not require a thesis, Master's Comprehensive Examination, or the passing of a reading examination in a foreign language.

The student works closely with the Committee on Forensic Science in designing a program to meet his particular interests, needs, and background. Inquiries and applications should be addressed to the Graduate School of Arts and Sciences.

GW-Washington Project

Associate Professor C.C. Mondale
Instructor R.S. French

EXPERIMENTAL HUMANITIES

FIRST GROUP

- 51 **Individuality in the Urban Community** (3) French, Holmstrom
Study of the meaning of individuality under urban conditions, in the American past and present, as revealed in the arts and in literature, and as implicit in the scientific study of the individual and the small group. Individual and/or group projects on topics of most concern to students. Admission by permission of instructor. (Fall—day)
- 52 **Urban Goals and Agents of Change** (3) French, Holmstrom
Study of the meaning of community under urban conditions, in the American past and present; of goals for the "good" community; and of agencies of change. Individual and/or group projects examining means for the realization of particular goals, with special reference to the Washington metropolitan area. Prerequisite: Hum 51. Admission by permission of instructor. (Spring—day)

SECOND GROUP

- 101 **Supervised Work-Study** (6)
Individual student projects involving work with a community agency and a field-study project supervised by an appropriate faculty member. Admission by permission of instructor. (Fall and spring)

Genetics—Graduate Study

COMMITTEE ON GENETICS

S.O. Schiff (*Chairman*), W.F. Anderson, C.M. Berlin, Jr., V.H. Cohn, Jr., Rosalie De Giovanni-Donnelly, C.B. Jacobson, M.S. Legator, W.G. Nash, I.R. Telford

The Graduate School of Arts and Sciences offers an interdepartmental program leading to the degrees of Master of Science and Doctor of Philosophy in the field of Genetics. This program is directed by a Committee whose members are drawn from the departments of Anatomy, Biochemistry, Biological Sciences, Microbiology, Obstetrics and Gynecology, Pediatrics, and Pharmacology.

A baccalaureate degree is required for admission to the degree program. The undergraduate program must have included the following: 8 semester hours each in biology, inorganic chemistry, organic chemistry, and physics; and 6 semester hours of English composition and literature. While not required for admission, courses in embryology, histology, genetics, and mathematics are strongly recommended.

Master of Science in the field of Genetics.—Required: the general requirements, pages 91-97. The 30 semester hours required in this program must include Gnet 201-2 and Gnet 299-300. The remaining 20 semester hours of course work are to be selected, with the approval of the Committee on Genetics, from the departmental courses listed below.

Doctor of Philosophy fields of study in Genetics: Bacterial Genetics, Biochemical Genetics, Cytogenetics, Medical Genetics, Mutagenesis, Pharmacogenetics, Radiation Genetics, and Reproductive Genetics.—See pages 91-95, 97-99, for requirements for the degree. The program of study must include Gnet 301-2, 8 to 10 semester hours of biochemistry, 8 to 10 semester hours of cell biology, 10 to 12 semester hours of genetics, and 2 or 3 semester hours of statistics. These courses may be selected from the departmental listings below.

GENETICS

THIRD GROUP

201-2 **Advanced Problems in Genetics (2-2)**

Staff

Individual study with each member of the Committee on Genetics. Required of all Master's degree candidates in the field of Genetics. (Academic year)

295 **Research (arr.)**

Staff

Open to qualified Master's degree students. Research on problems approved by the Committee on Genetics. May be repeated for credit. (Fall and spring)

299-300 **Thesis Research (3-3)**

Staff

(Academic year)

FOURTH GROUP

301-2 **Advanced Problems in Genetics (2-2)**

Staff

Individual study with each member of the Committee on Genetics. Required of all students preparing for the Doctor of Philosophy general examination whose field of study is Genetics. (Academic year)

398 **Advanced Reading and Research (arr.)**

Staff

Limited to students preparing for the Doctor of Philosophy general examination. May be repeated for credit. (Fall and spring)

399 **Dissertation Research (arr.)**

Limited to Doctor of Philosophy candidates. May be repeated for credit. (Fall and spring)

ANATOMY

203 *Human Embryology (1)*256 *Human Genetics (1)*260 *Electron Microscopy in Cellular Biology—Lecture (1)*261 *Electron Microscopy in Cellular Biology—Laboratory (1)*

BIOCHEMISTRY

221-22 *General Biochemistry (4-4)*224 *Biochemistry of the Enzymes (1)*227 *Biochemistry Seminar (1)*258 *Inherited Metabolic Diseases (1)*266 *Biochemical Genetics (1)*

BIOLOGICAL SCIENCES

BIOLOGY

108 *Organic Evolution (3)*115 *Cytology (4)*

272 COURSES OF INSTRUCTION

- 118 *Advanced Cytology* (3)
- 119 *Cell Biochemistry* (4)
- 127 *Genetics* (4)
- 138 *Advanced Genetics* (3)
- 167 *Radiation Biology* (3)
- 206 *Seminar: Radiation Biology* (3)
- 207 *Seminar: Origins of Life* (3)
- 219 *Seminar: Topics in Cell Biochemistry* (3)
- 227 *Seminar: Genetics* (3)

ZOOLOGY

- 145 *Introduction to Vertebrate Embryology* (3)

EPIDEMIOLOGY AND ENVIRONMENTAL HEALTH

- 230 *Biostatistics* (2)

MICROBIOLOGY

- 258 *Microbial Genetics* (2)

OBSTETRICS AND GYNECOLOGY*

- 391 *Cytogenetics* (1)
- 392 *Reproductive Genetics* (1)
- 395 *Gametogenesis* (1)
- 399 *Medical Genetics* (1)

PATHOLOGY

- 262 *Problems in Experimental Cellular Pathology* (1)

PHARMACOLOGY

- 256 *Molecular Pharmacology* (2)

PHYSIOLOGY

- 201 *Physiology* (8)
- 273 *Investigative Electron Microscopy* (3)

STATISTICS

- 91 *Principles of Statistical Methods* (3)
- 117 *Analysis of Variance* (3)

* See the School of Medicine catalogue.

Geography and Regional Science

Associate Professor Marvin Gordon (Chairman)

Assistant Professors Subramaniam Moryadas, J.C. Lowe, Alice Andrews

Bachelor of Arts with a major in Geography (Departmental).—Prerequisite: the Arts and Letters curriculum, page 78, including Geog 51, 52; Geol 1; and an introductory course in Statistics.

Required: in addition to the general requirements, pages 83–87, 27 semester hours of Geography beyond first-group courses, including Geog 103 and 104; 15 hours from Group A and 3 hours from Group B.

Group A: Geog 105, 125, 126, 127, 132, 134, 141, 146. Group B: Geog 151, 153, 155, 161, 165, 166.

Master of Arts in the field of Geography.—Prerequisite: a Bachelor of Arts degree with a major in Geography from this University, or equivalent.

Required: the general requirements, pages 91–97, including Geog 299–300.

Bachelor of Arts in Education with a teaching field in Geography.—Prerequisite: the Education curriculum, page 80.

Required: the Geography option and the professional courses listed on pages 110, 115–16.

Master of Arts in Education with a field in Classroom Teaching (specialization in Geography).—Prerequisite: a Bachelor's degree with sufficient concentration in Geography to permit successful pursuit of graduate study in the Department of Geography and Regional Science. Candidates must be accepted by both the School of Education and the Department of Geography and Regional Science.

Required: the general requirements, pages 117–20, including 15 semester hours of graduate courses in Geography.

FIRST GROUP

51 Introduction to Geography (3)

Staff

Interrelated processes affecting the character of landforms, hydrography, soils, vegetation, and climate; relevance of their world patterns to man. (Fall and spring—day)

52 World Regional Patterns (3)

(Formerly World Regions)

Emphasis on spatial aspects of man's activities within a world regional framework. (Fall and spring—day)

SECOND GROUP

Geog 151, 153, 155, 161, 165, and 166 are regional survey courses and provide an introduction to more detailed study of geographic regions. Characteristics, interrelationships, and areal distributions of natural and cultural phenomena are considered. Regional courses offered by the departments of Economics, History, and Political Science are recommended for students interested in the study of specific areas.

103 Cartography and Graphics (3)

Lowe

Principles of cartography; emphasis on problems of presenting spatial data. Laboratory fee, \$11. (Fall—day)

- 104 **Quantitative Cartography** (3) Lowe
Application of selected descriptive and statistical techniques to the solution of spatial problems. Laboratory fee, \$11. (Spring—day)
- 105 **Weather and Climate** (3) Staff
Climatic elements and their controls, analysis of world climatic patterns. (Fall—day)
- 125 **Transportation Geography** (3) Lowe
Problems of interaction, diffusion, and information transfer as they appear in a spatial context. (1970-71 and alternate years: spring—day)
- 126 **World Economic Geography** (3) Moryadas
World patterns and processes underlying the areal structure of selected economic activities. (Fall—day)
- 127 **World Population and Settlement** (3) Gordon
Patterns of world population; factors contributing to population pressures, growth, and migrations.
- 132 **Natural Resources** (3) Staff
Implications for society of the areal variations in natural resources and methods of resource use. (Spring—day)
- 134 **Location of Industry** (3) Moryadas
Structure of major world industries, location theory and locational requirements. (Spring—day)
- 141 **Urban Settlement** (3) Lowe
Location, functions, and forms of cities; urban-rural relationships; urban problems and the history of their development. (Fall—day)
- 145 **Cultural Geography** (3) Lowe
Analysis of the relationships between culture and environment; emphasis on spatial and ecological considerations. (1971-72 and alternate years: spring—day)
- 146 **World Political Geography** (3) Gordon
Analysis of the interrelationships between the political community and the human and physical environment. (Fall and spring—day)
- 151 **United States and Canada** (3) Moryadas
(Fall—day)
- 153 **Europe** (3) Staff
- 155 **Africa** (3) Staff
- 161 **Latin America** (3) Gordon
(Spring—day)
- 165 **Asia** (3) Moryadas
(Spring—day)
- 166 **Soviet Union** (3) Staff

172 Historical Geography (3)

Study of man's transformation and use of the earth as viewed within a specific historical frame of reference.

189-90 Readings in Geography (arr.)
(Academic year)

Staff

THIRD GROUP**205 Introduction to Regional Science I (3)**

Moryadas

The regional concept and techniques of regionalization, the distance factor in human interaction, measurement of location. (Fall—evening)

206 Introduction to Regional Science II (3)

Moryadas

Location theory—agricultural, industrial, urban; statistical methods of testing theory; sources and problems of areal data. (Spring—evening)

210 Seminar: Applied Economic Geography (3)

Staff

Problems in analyzing area and site development potential; evaluating alternative locational possibilities for manufacturing, commercial, and service facilities.

222 Climate and Human Settlement (3)

Staff

Interrelationships between weather and climate and man's activities. (Spring—evening)

223 Seminar: Population Geography (3)

Gordon

Analysis of the spatial variations of population characteristics and their environmental interrelationships. (Fall—evening)

243 Seminar: Urban Geography (3)

Lowe

Functional processes affecting the morphology, evolution, and areal arrangement of urban phenomena. (Spring—evening)

244 City Region (3)

Lowe

Town-country interrelationships, functional character and spatial structure of the urban sphere of influence. (Fall—evening)

265 Seminar: Geography of the Soviet Union (3)

Baclawski

Physical features, economic geography, natural and energy resources, industries. Soviet transportation system, agriculture, multinational population trends; emphasis on population patterns along borderlands, especially Sino-Soviet border. (Fall—evening)

266 Seminar: Geography of China (3)

True

Physical and economic geography; emerging industries, energy resources, transportation system. Emphasis on population "explosion"—its distribution and significance—and on regional geography, particularly on the Sino-Soviet border, Manchuria, Tibet, Mongolia, Inner Mongolia, and Sinkiang. (Spring—evening)

287 Seminar: Problems in Latin American Civilization (3)

Rodríguez

Interdisciplinary seminar guided by a specialist within the methodology of his chosen discipline; each student writes a report on some aspect of a key theme (i.e., Nationalism) in Latin America's experience. Admission by permission of instructor. (Spring—day)

295 Research (arr.)

May be repeated once for credit. (Fall and spring)

Staff

299-300 Thesis Research (3-3)

(Academic year)

Staff

Geology

Professors Geza Teleki (*Chairman*), G.V. Carroll, Charles Milton (*Research*), F.R. Siegel

Adjunct Professors J.W. Pierce, E.G. Kauffman, I.G. Sohn

Professorial Lecturers Nicholas Hotton, Daniel Appleman, P.M. Kier, Norman Herz

Associate Professors A.G. Coates, R.C. Lindholm

Associate Professorial Lecturers W.E. Maloney, M.A. Buzas, J.E. Hazel, Isidore Zietz, W.G. Melson

Lecturers D.H. Massie, J.E. Merida, Frederick Collier

*Bachelor of Arts or Bachelor of Science with a major in Geology (Departmental).—*Prerequisite: the Arts and Letters or the Science curriculum, respectively, pages 78-79. The following first-group courses must be included: Geol 1-2, 14; Chem 11-12; Phys 1 and 2 or B Sc 11-12; Math 31 or former 22; Stat 91.

Required: in addition to the general requirements, pages 83-87, 24 semester hours in Geology beyond first-group courses for the Bachelor of Arts degree; 30, for the Bachelor of Science degree. The work of the junior and senior years must be approved by the Department. Two foreign languages are recommended for students planning to do graduate work. Phil 121 and 151 are recommended as senior-year electives.

*Master of Arts or Master of Science in the field of Geology.—*Prerequisite: the degree of Bachelor of Arts or Bachelor of Science, respectively, with a major in Geology from this University, or equivalent.

Required: the general requirements, pages 91-97, including Math 31 or former 22, or Stat 91, or equivalent, for the degree of Master of Science only. Candidates must pass the Master's Comprehensive Examination before registration for the second half of the thesis work. A reading knowledge examination in French, German, Russian, or Spanish (with permission of Department), must be passed before the second half of the work is started.

*Master of Science in the field of Geochemistry (an interdepartmental degree offered by the departments of Geology and Chemistry).—*Prerequisite: a Bachelor's degree with a major in Geology or in Chemistry from this University, or equivalent.

Required: the general requirements, pages 91-97, including Chem 111, 112; Geol 141, 241, 249, and Geol 245 or Chem 213. The Master's Comprehensive Examination must be taken before registration for the second half of the thesis work. A reading knowledge examination in a foreign language, approved by the Department of Geology or Chemistry, must be passed before the second half of the work is started.

*Doctor of Philosophy fields of study in Geology: Geomorphology, Mineralogy, Paleontology, Petrology, Sedimentology, Stratigraphy, and Structural Geology.—*See pages 91-95, 97-99, for requirements for the degree.

*Doctor of Philosophy field of study in Geochemistry (an interdepartmental field offered by the departments of Geology and Chemistry).—*See pages 91-95, 97-99, for requirements for the degree.

Bachelor of Arts in Education with a teaching field in Earth Science.—Prerequisite: the Education curriculum, page 80.

Required: the Earth Science option and the professional courses listed on pages 108, 115–16.

FIRST GROUP

1–2 Introductory Geology (3–3)

Staff

Lecture (2 hours), laboratory (2 hours), optional field trips. Survey covering the principles of geology. Laboratory fee, \$10 a semester. (Geol 1: fall—day; spring—evening. Geol 2: fall—evening; spring—day.)

14 General Petrology (3)

Carroll

Lecture (2 hours), laboratory (3 hours). Macroscopic study of rocks. Prerequisite: Geol 1–2 (concurrent registration for Geol 2 is accepted). Laboratory fee, \$10. (Fall—day)

91 Laboratory Techniques I (2)

Massie

Introduction to photographic procedures and techniques. Laboratory fee, \$15. (Fall—Saturday)

92 Laboratory Techniques II (2)

Collier

Introduction to laboratory machinery and techniques, preparation of thin sections, grinding and polishing techniques, fossil preparation, organization and handling of collections. Laboratory fee, \$15. (Spring—Saturday morning)

SECOND GROUP

101 History of Geological Sciences (3)

Teleki

Development of geological and scientific thought; history of geological and related sciences. (1971–72 and alternate years)

111–12 Mineralogy (4–4)

Carroll

Lectures and laboratory. Geol 111: morphological and optical crystallography. Geol 112: paragenetic and systematic mineralogy. Admission by permission of instructor. Laboratory fee, \$12 a semester. (Academic year—day)

113 Crystallography (3)

Appleman

Lectures and laboratory. Point-group and space-group theory, fundamentals of crystal structure, elementary X-ray diffraction theory, application of X-ray diffraction to mineral identification. Prerequisite: Math 31 or former 22. Laboratory fee, \$15. (1970–71 and alternate years: spring—day)

114 Petrography (2)

Carroll

(This course, together with Geol 115, replaces former Geol 115 Petrography (4))

Study of rocks by use of the polarizing microscope. Admission by permission of instructor. Laboratory fee, \$6. (Fall—day)

- 115 **Laboratory in Petrography** (1) Carroll
(This course, together with Geol 114, replaces former Geol 115 Petrography (4))
 Specialized training in petrography. Admission by permission of instructor. May be repeated for credit. Laboratory fee, \$6. (Fall and spring—day)
- 116 **Sedimentary Petrography** (4) Lindholm
 Lecture (2 hours), laboratory (4 hours). Identification, classification, and interpretation of common sedimentary rocks by means of the petrographic microscope. Prerequisite: Geol 163 or permission of instructor. Laboratory fee, \$12. (Spring—day)
- 122 **Structural Geology** (3)
 Lectures and field trips. Genetic interpretation of geologic formations on basis of their structures; emphasis on applications to geologic field work. Prerequisite: Geol 1-2, Math 31 or former 22. Laboratory fee, \$5. (Fall—day)
- 125 **Marine Geology** (3) Pierce
 Lecture and map work. Principles of oceanography and submarine geology; geology of the deep sea; topography, crustal structure, sedimentary processes, and marine environment. Prerequisite: Geol 1-2. (1971-72 and alternate years)
- 128 **Geomorphology** (4) Teleki
 Lecture (2 hours), laboratory (2 hours), field trips as arranged. Nature and evolution of earth forms, interpretation of maps and aerial photographs. Prerequisite: Geol: 1-2, 101; or permission of instructor. (1970-71 and alternate years: fall—day)
- 132 **Economic Geology** (3) Herz
 Principles and processes of formation of mineral deposits. Modes of occurrence, origin, distribution, and utilization of metalliferous and non-metalliferous deposits. (Spring—evening)
- 141 **Introductory Geochemistry** (3) Siegel
 Lecture (2 hours), laboratory as arranged. Principles and theories on the abundance, relationships, and distribution of the elements in various rock and mineral species. Prerequisite: Geol 114 and 115, or equivalent; Chem 11-12; Math 30 or former 21; Phys 1, 2. Laboratory fee, \$12. (Fall—day)
- 147 **Chemical Geology in the Earth and Ocean Sciences** (3)
 Introduction to geochemical and chemical principles involved in the understanding of geological systems, and their application to contemporary problems in oceanology, pollution, and mineral exploration. Laboratory fee, \$12.
- 151-52 **Invertebrate Paleontology** (3-3) Coates
 Lecture and laboratory (5 hours), field trips as arranged. A systematic treatment of the invertebrate fossil groups, emphasis on the macroinvertebrates. The evolution and paleoecology of the groups will be introduced. Prerequisite: Geol 1-2. Laboratory fee, \$12 a semester. (Academic year—day)

- 154 **Vertebrate Paleontology** (3) Hotton
Lecture (2 hours), laboratory or field as arranged. General features of vertebrate morphology and evolution as illustrated by the fossil record; problems of paleoecology and adaptation, where appropriate. (Fall—evening)
- 155 **Evolution of Plants** (3) Staff
(Formerly Paleobotany)
Lecture (2 hours), laboratory or field as arranged. General features of fossil plant morphology, evolution, and classification. Laboratory fee, \$12. (1971-72 and alternate years)
- 157 **Methods in Paleontology** (3) Sohn
Introduction to principles and techniques of paleontological research, including rules of zoological nomenclature. Prerequisite: Geol 151-52. (1971-72 and alternate years)
- 158 **Micropaleontology** (3) Sohn and Staff
Lecture and laboratory (5 hours). Classification, evolution, and paleoecology of the important microfossil groups with special reference to Foraminifera and Ostracoda, including conodonts, radiolaria, diatoms, and coccoliths. Prerequisite: Geol 151-52 or permission of instructor. Laboratory fee, \$12. (1970-71 and alternate years: fall—evening)
- 163 **Sedimentation** (4) Lindholm and Staff
Lecture (2 hours), laboratory (4 hours), field trips as arranged. Principles of sedimentation, analysis and interpretation of sedimentary processes and environment, laboratory experiments in the properties of sedimentary particles. Prerequisite: Geol 111 or permission of instructor. Laboratory fee, \$15. (Fall—day)
- 166 **Principles of Stratigraphy** (4) Coates and Staff
Lecture (2 hours), laboratory (4 hours). Introduction to physical and biological stratigraphy. Prerequisite: Geol 151-52. (Fall—day)
- 172 **Regional Geology** (3) Staff
Lecture, research, and discussion of major geologic or physiographic regions. Prerequisite: Geol 122. (Spring—day)
- 181 **Oceanography I** (3) Maloney
Chemical and physical properties of sea water, movements of water masses, meteorological interrelations, ecology of marine plants and animals. Prerequisite: Math 33 or former 23, or equivalent; or permission of instructor. (1970-71 and alternate years: spring—day)
- 182 **Oceanography II** (3) Maloney
Boundary processes and interactions between sea water and the atmosphere, principles of dynamics and their application to motion and distribution of variables, acoustics of water masses, review of recent literature and problems. Prerequisite: Geol 181. (Fall—day)
- 187 **Geophysics for Geologists I** (3) Zietz
Basic geophysics to assist the geologist in detailed and regional mapping and in solving fundamental geologic problems. Emphasis on magnetic, gravimetric, and radioactive methods. Prerequisite: Math 31 or former 21; Phys 1, 2. (Spring—evening)

- 188 Geophysics for Geologists II (3)** Zietz
Basic geophysics to assist the geologist in mapping and in solving geologic problems. Emphasis on seismic, electric, and electromagnetic methods. Prerequisite: Math 31 or former 21; Phys 1, 2. (Fall—evening)

- 199 Undergraduate Research (arr.)** Staff
Problems approved by the staff. May be repeated once for credit. (Fall and spring)

THIRD GROUP

- 205 Seminar in Geology (3)** Staff
Special topics each semester. May be repeated for credit. (Fall and spring)

- 212 Crystal Chemistry (3)** Evans
(1971-72 and alternate years)

- 214 X-ray Mineralogy (3)** Appleman
Problems in X-ray mineralogy, crystal chemistry of rock forming minerals. Laboratory fee, \$15. (1971-72 and alternate years)

- 215 Seminar: Crystallography and Mineralogy (3)** Staff
(1970-71 and alternate years: spring—day)

- 219 Petrogenesis (3)** Staff
The origin of selected igneous and metamorphic rock types. Prerequisite: Geol 141, or permission of instructor. (1971-72 and alternate years)

- 223 Experimental and Theoretical Deformation (3)**
Lectures and field trips as arranged. Experimental deformation of natural materials and theoretical analysis of the natural deformation of rocks. Prerequisite: Geol 122, Math 32 or former 22; or permission of instructor. (1970-71 and alternate years: fall—day)

- 224 Advanced Structural Geology (3)**
Methods of study and the hypotheses of the genesis of structurally complex rock. Problems of orogeny. Prerequisite: Geol 122 or permission of instructor. (Spring—day)

- 241 Geochemistry (3)** Siegel
Chemical composition and physical properties of sea water, chemical composition and alterations of marine sediments, thermodynamics and biochemical activity in oceans. Methods of analysis and problems of measuring. Prerequisite: Math 32 or former 22, Phys 51-52; or permission of instructor. Recommended: Chem 22. Laboratory fee, \$18. (Spring—day)

- 242 Experimental Geochemistry (3)** Staff
Recent advances in geochemistry, instrumental methods and their application. Special topics. Does not repeat itself and can be repeated for credit. Prerequisite: Chem 111-12. (Spring)

- 244 Isotope Geology (3)**
Nuclear theory, isotopic variations due to radioactivity and fractionation, geochronometric measurements, and meteorites. Prerequisite: Geol 141

or permission of instructor. (1970-71 and alternate years: spring—evening)

245 Thermodynamics for the Geologist (3) Melson

Nature and definition of thermodynamics and the meaning of chemical equilibrium. Methods of graphical portrayal, significance and calculation in equilibrial relations and systems. Prerequisite: Math 32 or former 22. Recommended: Math 33 and Phys 51-52. (1971-72 and alternate years)

246 Physical Chemistry in Relation to Geologic Problems (3) Melson

The origin of the atmosphere, equilibria in sea water, diagenesis, equilibrium in metamorphic rocks, composition and temperature-pressure relations in ore solutions, and the mechanism of ore formation; thermodynamics of magma. Prerequisite: Geol 245. (1971-72 and alternate years)

249 Seminar: Geochemistry (2) Siegel

Independent topics each semester; may be repeated for credit. (Fall and spring—as arranged)

253 Applied Paleontology (3) Hazel and Staff

Wide-ranging treatment of the use of fossils in several fields including biostratigraphy, paleobiogeography, paleotemperature; paleochemical analyses and the solving of particular geologic problems. Prerequisite: Geol 151-52. (1970-71 and alternate years: fall—evening)

254 Interpretive Paleontology (3) Kauffman and Staff

Comparative study of form and function in fossil and recent organisms as related to the interpretation of evolution. Prerequisite: Geol 151-52.

255 Population Paleoecology (3) Buzas

Characteristics of populations applicable to the fossil record. Subject matter includes ecosystem concept, habitat, Hutchinsonian niche, life-death, size frequency distributions, competitive exclusion principle, spatial distributions, relative abundance and diversity, quantification of community biofacies. Prerequisite: Geol 151-52, Stat 91; or permission of instructor. (1971-72 and alternate years)

263 Advanced Sedimentology (arr.) Pierce

Prerequisite: Geol 163. Laboratory fee, \$15. (Spring—evening)

295 Research (arr.) Staff

Research on problems approved by the Staff. Open to qualified students with advanced training. May be repeated for credit. (Fall and spring)

299-300 Thesis Research (3-3) Staff

(Academic year)

FOURTH GROUP

398 Advanced Reading and Research (arr.) Staff

Limited to students preparing for the Doctor of Philosophy general examination. May be repeated for credit. (Fall and spring)

399 Dissertation Research (arr.)

Limited to Doctor of Philosophy candidates. May be repeated for credit.
(Fall and spring)

Staff

Germanic Languages and Literatures

Professors W.K. Legner, J.C. King

Associate Professors Klaus Thoenelt, Carl Steiner (*Chairman*), L.G. Seeger

Lecturers Blanche Gardner, Margaret Guenther

Bachelor of Arts with a major in Germanic Languages and Literatures (Departmental).—Prerequisite: the Arts and Letters curriculum, page 78, including Germ 9-10 and 51-52.

Required: in addition to the general requirements, pages 83-87, a minimum of 24 semester hours in German courses above the first group, including Germ 179-80; reasonable proficiency in speaking and writing German; Hist 39-40 or equivalent; 6 semester hours in Philosophy selected with the approval of the adviser. Majors in German are strongly advised to study French.

Master of Arts in the field of Germanic Languages and Literatures.—Prerequisite: a Bachelor of Arts degree with a major in Germanic Languages and Literatures from this University, or equivalent.

Required: the general requirements, pages 91-97, including a reading knowledge of French and a thesis in the field of German literature or linguistics.

Doctor of Philosophy fields of study in Germanic Languages and Literatures: Old High German Language and Literature, Old Norse Language and Literature, Middle High German Language and Literature, Early New High German Language and Literature, Classicism, Romanticism, Realism, 20th Century German Literature, and Linguistic Analysis.—See pages 91-95, 97-99, for requirements for the degree.

Bachelor of Arts in Education with a teaching field in German.—Prerequisite: the Education curriculum, page 80.

Required: the German option and the professional courses listed on pages 111, 115-16.

Placement Examination: A standardized placement examination given before registration is required of all entering students who wish to continue in college the language begun in high school. Upon completion of the examination, assignment is made to the appropriate course, with credit assigned on the usual basis.

FIRST GROUP

1-2 First-year German (3-3)

A year course: credit toward a degree at this University given on completion of Germ 2. Essentials of German grammar; translation of easy prose. Three classroom periods a week plus one period of aural-oral practice in language laboratory. Laboratory fee, \$17.50 a semester.
(Germ 1: fall—day and evening; spring—day. Germ 2: fall—day; spring—day and evening.)

Staff

*3-4 Second-year German (3-3)

A year course: credit toward a degree at this University given on completion of Germ 4. Selections from modern German prose; continuation

Staff

* With permission of instructor, Germ 9-10 or 51-52 may be taken concurrently with Germ 4.

and review of grammar. Three classroom periods a week plus one period of aural-oral practice in language laboratory. Laboratory fee, \$17.50 a semester. Prerequisite: Germ 1-2 or two years of high school German. (Germ 3: fall—day and evening; spring—day. Germ 4: fall—day; spring—day and evening.)

*9-10 **German Conversation and Composition** (3-3) Steiner
(Academic year—day)

47 **Beginning German for Reading Examination Candidates** (0) Staff
Specifically for graduate students with little or no German, who are preparing for reading examinations. No academic credit. Tuition fee, \$204. (Fall and spring—evening)

49 **German Readings for Nonmajor Students** (3) Staff
Primarily for graduate students preparing for reading examinations. Undergraduates admitted with permission of instructor. No academic credit for graduate students. Prerequisite: Germ 4 or 47, or equivalent. (Fall and spring—evening)

*51-52 **Introduction to German Literature** (3-3) Legner, Seeger
Lecture, recitation, and discussion in German. Selected readings in German literature from the earliest periods to the present. (Academic year—day)

SECOND GROUP

103-4 **Goethe's "Faust"—Parts I and II** (3-3) Legner
(1971-72 and alternate years)

131-32 **18th Century German Literature** (3-3) Thoenelt
Enlightenment, Storm and Stress, Classicism. (1971-72 and alternate years: academic year—day)

141-42 **19th Century German Literature** (3-3) Steiner
Romanticism, Biedermeier, Young Germany, Realism. (1970-71 and alternate years: academic year—day)

151-52 **20th Century German Literature** (3-3) Seeger
The age of Nietzsche, Naturalism, Expressionism, Kafka, Thomas Mann; contemporary drama; authors of Gruppe 47. (1971-72 and alternate years: academic year—evening)

161-62 **Studies in German Literature** (3-3) Seeger
(Formerly *Special Readings in German Literature for Majors*)
Readings of representative writers of short prose; lectures and discussions—in German.

179-80 **Advanced Conversation and Composition** (3-3) Thoenelt
For undergraduate and graduate majors. (Academic year—day)

* With permission of instructor, Germ 9-10 or 51-52 may be taken concurrently with Germ 4.

THIRD GROUP

- 201-2 **Middle High German** (3-3)
(1971-72 and alternate years: academic year—evening) Legner
- 205-6 **Gothic** (3-3)
Introduction to the comparative study of Germanic languages. Legner
- 209-10 **Old High German** (3-3)
(1970-71 and alternate years: academic year—evening) King
- 213-14 **Old Norse** (3-3)
(1971-72 and alternate years: academic year—evening) Allee
- 223-24 **Linguistic Analysis of Modern German** (3-3)
Treatment of phonetics, phonemics, morphology, and syntax. King
- 225-26 **Seminar: Linguistics** (3-3)
Bibliography, methodology, readings, and research problems. King, Allee
- 227-28 **Sanskrit—Introduction to Indo-European Linguistics** (3-3)
Old Indic language and literature. (1971-72 and alternate years: academic year—evening) King
- 229 **15th and 16th Century German Literature** (3)
Transition from chivalric to bourgeois literature. The eras of Humanism and the Reformation as reflected in the principal literary works. (1970-71 and alternate years: fall—evening) Legner
- 230 **17th Century German Literature** (3)
Imitation of foreign models. The literary societies. Preciosity. The beginnings of realism in the novel. Pietism. (1970-71 and alternate years: spring—evening) Legner
- 231-32 **German Classicism** (3-3)
Advanced study and critique of the classical literature of the Goethe era. Prerequisite: Germ 131-32 or equivalent. (1970-71 and alternate years: academic year—evening) Thoenelt
- 241-42 **Seminar: German Romanticism** (3-3)
Treatment of individual writers, groups, motifs, and tendencies. 72 and alternate years: academic year—evening) Thoenelt (1971-)
- 251-52 **Seminar: Studies in 20th Century German Literature** (3-3)
Special projects in fiction, drama, poetry, and criticism. (1970-71 and alternate years: academic year—evening. Topic for 1970-71: The Modern German Novel.) Seeger
- 271-72 **Seminar: German Realism** (3-3)
(Formerly Seminar: German Literature)
Analysis of authors, works, genres, and literary trends. (1971-72 and alternate years: academic year—evening. Topic for 1971-72: Stifter and Keller.) Staff (Acad.)
- 299-300 **Thesis Research** (3-3)
Required of all candidates for the Master's degree in German. (Academic year)

FOURTH GROUP

398 Advanced Reading and Research (arr.) Staff

Limited to students preparing for the Doctor of Philosophy general examination. May be repeated for credit. (Fall and spring)

399 Dissertation Research (arr.) Staff

Limited to Doctor of Philosophy candidates. May be repeated for credit. (Fall and spring)

Greek

See "Classics."

Health Care Administration

Professors F.H. Gibbs, Leon Gintzig (*Chairman*), W.A. Hamrick
 Professorial Lecturers C.U. Letourneau, M.J. Taves
 Associate Professor Lloyd Bartholomew
 Associate Professorial Lecturers G.E. Morris, W.A. Parker, E.P. Stanford
 Assistant Professor P.N. Reeves
 Assistant Professorial Lecturer H.R. Wertlieb
 Instructor L.W. Katz

Programs of study in Health Care Administration leading to the degrees of *Master of Arts in Health Care Administration*, *Master of Business Administration*, *Master of Public Administration*, *Graduate Certificate in Health Care Administration*, *Doctor of Business Administration*, and *Doctor of Public Administration* are offered by the School of Government and Business Administration (see pages 127-52).

SECOND GROUP

153-54 Survey of Health Care Organization and Procedures (3-3)

Introduction to the history, concepts, and activities of health care systems in this country. Emphasis on organization and procedures used in various types of health care facilities. Not open to Master's degree candidates in Health Care Administration. (Academic year—evening)

THIRD GROUP

202 Introduction to Health Care Administration (3) Bartholomew, Parker

Lecture and discussion (2 hours), laboratory (2 hours). Survey of state, national, and community health services; includes medical terminology, communicable diseases, environmental sanitation, and biostatistics. (Fall—day and evening)

203 Organization and Management (3) Hamrick

Lecture and discussion (2 hours), laboratory (2 hours). History and current character of institutional health care. Organizational functions and

structure of various kinds of facilities related to health care administration. Prerequisite or concurrent registration: Mgt 201. (Fall and spring)

- 204 **Planning and Support Agencies and Associations** (3) Staff
Functions performed and special support techniques of hospital, medical, public health, nursing home, planning, educational, and similar associations.

- 205 **Hospital Management Procedures** (3) Bartholomew
Lecture and discussion (2 hours), laboratory (2 hours). Departmental administration. Survey of hospital law; hospital forms, procedures, and systems; and hospital programs pertaining to disaster relief, safety, fire prevention. (Fall and spring—day)

- 206 **Case Studies in Health Care Administration** (3) Gintzig, Gibbs
Discussion (2 hours), laboratory (2 hours). General ideas about administration applied to practical cases. Emphasis on policy making, planning, controlling, and organizing. Prerequisite: HCA 203 and Mgt 201. (Fall and spring—day)

- 207 **Management Analysis in Health Care Institutions** (3) Gintzig
Lecture (2 hours), laboratory (2 hours). Basic investigation and problem-solving techniques, including various methods of collecting, analyzing, reporting, and using information that can be made available to administrators of hospitals and other medical care institutions. (Fall and spring)

- 209 **Health Care Economics and Financial Management** (3) Katz
Lecture (2 hours), laboratory (2 hours). Economic and financial analysis of the interactions between consumers of health care, providers of health care, and public and private prepayment and insurance programs. Industry price structure and the long- and short-term capital requirement of health care institutions. (Fall—day; spring—day and evening)

- 210 **Advanced Financial Management of Health Care Institutions** (3) Katz
Nature and interpretation of health care institution financial reports. Techniques of financial planning and control; operation of third-party reimbursement contracts; capital needs, planning, and acquisition; case studies, field research. Emphasis on nonprofit, short-term care institutions. Prerequisite: HCA 209. (Fall or spring)

- 212 **Health Project Planning** (3) Hamrick, Reeves
(Formerly *Planning and Constructing Health Care Facilities*)
Lecture (2 hours), laboratory (2 hours). Basic health planning methods and procedures for those students engaged in planning a specific facility or service. Prerequisite: HCA 202 and 203. (Spring)

- 213 **Administration of Health Care Systems** (3) Gintzig
Comparative evaluation of various organizational patterns, functions, and trends in health care systems by intensive examination of factors which have led to differentiating functions and reciprocal relationships. Emphasis on the sources of such differences and significance of the systems to the health care of a nation. (Fall or spring)

- 214 Health Systems Planning (3)** Staff
Advanced health planning for those students concerned with development of health systems; emphasis on the legal, political, social, and economic factors influencing health planning. Prerequisite: HCA 212. (Fall or spring)
- 215 Practicum in Health Project Planning (3)** Staff
Supervised practical instruction in agencies doing comprehensive health planning; emphasis on basic investigation and problem-solving techniques, including various methods of collecting, analyzing, and reporting data. Prerequisite: HCA 212. (Fall or spring)
- 216 Seminar: Health Systems Planning (3)** Staff
An analysis of the effect of legal, political, social, and economic factors on the planning of health systems. This analysis will be conducted through the use of games and simulation models. Prerequisite: HCA 214 and 215. (Fall or spring)
- 250 Administration for Mental Care (3)** Morris
Special characteristics of administration required in mental hospitals, psychiatric sections of general hospitals, mental health clinics, and others. (Fall or spring)
- 260 Administration for Long-term Care Facilities (3)** Wertlieb
Comparative evaluation of characteristics of long-term care institutions: variety of facilities (extended care, nursing homes, homes and housing for the aged, etc.); internal and external professional services essential to facilities; relation of purposes and functions of institutions to total health needs of community. (Fall)
- 261 Business Procedures for Long-term Care Facilities (3)** Wertlieb
Research, analysis, and discussion of health facility organization and management. (Spring)
- 265-66 Readings in Long-term Care Administration (3-3)** Staff
Advanced studies in selected aspects of administration of long-term care facilities, including nursing homes, homes for the aged, and others. (Fall or spring)
- 267 Social Gerontology for the Administrator (3)** Stanford, Taves
Special characteristics of the elderly with which administrators of long-term care facilities should be acquainted. (Fall and spring)
- 270 Research in Health Care Administration (3)** Gintzig, Reeves
Field research. Primarily for doctoral candidates; open to other graduate students with consent of instructor. (Fall or spring)
- 285-86 Readings in Health Care Administration (3-3)** Staff
Supervised readings in some special areas or subdivisions of health care administration. Primarily for doctoral candidates; open to other students by arrangement. (Academic year)
- 287 Seminar: Integration of Health Care Administration (3)** Staff
Primarily for doctoral candidates; open to other students by arrangement.

- 288 **Seminar: Field Problem Studies in Health Care Administration (3)** Staff
 Selected administrative issues and problems arising in health care facility situations. Primarily for doctoral students; open to other students by arrangement. (Fall or spring)
- 293-94
 -95 **Residency I (3-3-3)** Bartholomew, Gibbs, Hamrick, Katz, Reeves
 Twelve-month residency, beginning each year June 1 or July 1. Work experience under a qualified preceptor, periodic written progress reports, and a written major report.
- 296-97
 -98 **Residency II (3-3-3)** Gintzig
 For selected students who take a second twelve-month residency; begins June 1 or July 1 each year. Staff
- 299-300 **Thesis Research (3-3)**
 (Academic year)

FOURTH GROUP

- 398 **Advanced Reading and Research (arr.)** Gintzig, Reeves
 Limited to doctoral students preparing for the general examination. May be repeated for credit. (Fall and spring)
- 399 **Dissertation Research (arr.)** Gintzig, Bartholomew
 Limited to doctoral candidates. May be repeated for credit. (Fall and spring)

History

Professors Wood Gray, H.M. Merriman, R.H. Davison, R.B. Thompson, F.H. Michael, R.C. Haskett, R.P. Sharkey (*Chairman*), Mario Rodríguez, H.M. Sachar

Professorial Lecturers R.P. Multhaupt, T.G. Jackson, Jr.

Associate Professors C.J. Herber, R.W. Kenny, P.P. Hill, W.R. Johnson, Lois Schwoerer, Linda DePauw, Richard Thornton

Assistant Professors A.D. Andrews II, R.A. Hadley

Bachelor of Arts with a major in History (Field-of-Study).—Prerequisite: the Arts and Letters curriculum, page 78, including Hist 39-40 or 91-92, and 71-72. Required: the general requirements, pages 83-87, and the passing of the History major examination in the senior year.

The major, and the major examination which attests it, is centered on the study of the Mediterranean rise, European development, and trans-Atlantic spread of Western Civilization, its interaction with other civilizations in a world context, and its continuing challenges to the present day. Under the guidance of an adviser the student will arrange his program in History to attain, insofar as possible, a balanced evaluation of (1) the rise of civilization in Europe from its Classical origins to the eve of the French Revolution; (2) the historic problems of modern Europe in the age of industry and ideology since 1789; (3) the political, social, economic, and cultural

forces of the United States in their world setting since 1607; and (4) the nature and development of civilization in the principal areas outside of the North Atlantic community. Two 3-hour seminars, at least one of which must be research, are required as a part of each major's program (except Honors Program, see below). A required proseminar (Hist 199) is a means of integrating the student's understanding of the continuity of Western Civilization in its world context. For details relating to the administration and content of the major, see the pamphlet on this subject which is available in the offices of the Dean of Columbian College of Arts and Sciences and the Department of History.

An Honors Program may be chosen by juniors with satisfactory scholastic records. Application to this Program must be made shortly before completion of the first semester of the junior year. Students accepted into the Program take a 3-hour research seminar in the second semester of the Junior year and complete the research requirements for the history major by preparing the Senior Honors Thesis (Hist 191-92) in the final year of undergraduate study. A special section of the proseminar is offered for students in the Honors Program in the first semester of the senior year.

Master of Arts in the field of History.—Prerequisite: A Bachelor's degree from an accredited college or university with a major in history, or equivalent; high scholastic standing; and approval of the Department. Applicants from other institutions must present scores on the Graduate Record Examination with the Advanced Test in History and arrange for four persons, preferably former instructors, to send letters or reference forms to the Office of the Graduate School of Arts and Sciences.

Required: the general requirements, pages 91-97. Candidates must complete either (1) a minimum of 30 semester hours of second- and third-group courses, including History 299-300 *Thesis Research*, or (2) a minimum of 36 semester hours of second- and third-group courses, including at least two research seminars (6 semester hours). At least 6 semester hours of each candidate's program must be in third- or fourth-group History courses; a maximum of 6 may be in approved courses outside the Department of History. Master's candidates are responsible for arranging with instructors of second-group courses for extra work, in order to receive graduate credit for such courses. Each student works in two fields of history.

Doctor of Philosophy fields of study in History.—The Department of History offers the following fields in which dissertations may be written and from which the four fields, including one broad major field, for the General Examination may be chosen: (1) *American History* (Colonial, Early National, Political, Diplomatic, Economic, Religious, Social, Negro), (2) *European History* (Classical Greek and Roman, Medieval, Early Modern, Modern, Economic, Diplomatic, English, French, German, Balkan, Iberian), (3) *Russian History*, (4) *Latin American History* (Colonial, Nene, Central American, Brazilian), (5) *Asian History* (Near Eastern, Modern Chinese, Modern East Asian), (6) *Canadian History*, (7) *Jewish History*, and (8) *History of Science*.—See pages 91-95, 97-99, for requirements for the degree.

Bachelor of Arts in Education with a teaching field in History.—Prerequisite: the Education curriculum, page 80.

Required: the History option and the professional courses on pages 111-12, 115-16.

Doctor of Philosophy fields of study in International Relations combine work in Economics, History, and Political Science.

Departmental prerequisite: Hist 39-40 or 91-92 is prerequisite to courses 108 through 158 and 187 through 196; Hist 71-72, to courses 167 through 185; either Hist 39-40, 71-72, or 91-92, to courses 162 through 166. Prerequisite to Hist 105-6 is either Hist 39-40, 91-92, or a background in a science. Students may waive one or more of the prerequisite courses by passing a departmental waiver examination, by attaining scores of 600 or above on the College Entrance Examination Board Achievement tests, or by good performance on Advanced Placement Examinations.

FIRST GROUP

39-40 European Civilization in Its World Context (3-3)

Staff

Primarily for freshmen. Hist 39: political, social, economic, and cultural history from ancient times to early modern era. Hist 40: from early modern era to present. Students cannot receive credit for both Hist 39-40 and 91-92. (Academic year—day and evening)

71-72 Introduction to American History (3-3)

Staff

Primarily for sophomores. Hist 71: political, social, economic, and cultural forces of the United States in their world setting from 1492 to 1861. Hist 72: from 1861 to present. (Academic year—day and evening)

91-92 World Civilizations (3-3)

Thompson

Hist 91: major civilizations of the world to 1500. Hist 92: Europocentric and world civilization since 1500. Students cannot receive credit for both Hist 39-40 and 91-92. (Academic year—day)

SECOND GROUP

105-6 History of Science (3-3)

Multhauf

Hist 105: ancient natural philosophy and growth of special sciences through the 17th century scientific revolution. Hist 106: scientific development from the 18th century to the scientific revolution of the early 20th century. Prerequisite: Hist 39-40 or a background in science. (Academic year—evening)

108 The Ancient Near East and Egypt to 600 A.D. (3)

Hadley

Survey of Egyptian, Mesopotamian, Anatolian, West Semitic, and Iranian civilizations from the Neolithic period to the Islamic conquest.

109 Early Aegean and Greek Civilizations to 200 B.C. (3)

Hadley

Neolithic background; Bronze age—Minoan, Helladic, and Mycenaean civilizations; classical Greek civilization to the eve of the Roman conquest. (Fall—day)

110 The Roman World to 455 A.D. (3)

Hadley

Prehistoric Italy; rise and decline of the Roman Empire and Latin civilization; cultural, social, and political developments in the Greek world under Roman rule. (Spring—day)

111-12 Medieval History (3-3)

Andrews

Development of the Latin Christian community. Hist 111: 4th to 10th century. Hist 112: 10th to 13th century. (Academic year—day)

113 Early Middle Ages (3)

Andrews

Mediterranean region from 4th to 11th century; emphasis on Byzantium.

116 History of Africa (3)

Survey of political, cultural, and economic development from ancient times to the present.

121 The Renaissance in Western Europe (3)

Schwoerer

Political, economic, intellectual, and cultural features of the Renaissance. 14th-16th centuries. Focus on Italy, but with attention to developments in France and England. (Fall—day)

- *127 **Theories of History** (3) Lavine
 Critiques of philosophies of history: idea of progress, historicism, Hegelian-Marxian dialectic, cyclical, and social-scientific views. Contemporary problems of historical knowledge.
- 131-32 **History of Germany** (3-3) Herber
 Political, social, and cultural development. Hist 131: from Reformation to unification. Hist 132: from unification to present. (Academic year—day)
- 138 **History of World Communism** (3) Thornton
 The international communist movement from its beginnings to the present. (Fall—day)
- 139-40 **World History in the 20th Century** (3-3) Sachar
 Main diplomatic, political, and cultural factors that have influenced 20th century life. Hist 139: from the turn of the century to the Munich settlement of 1938. Hist 140: from the Munich settlement to the last third of the 20th century. (Academic year—day)
- 141-42 **History of France** (3-3) Herber
 Political, social, and cultural. Hist 141: from earliest times to 1815. Hist 142: from 1815 to present.
- 145-46 **History of Russia** (3-3) Thompson
 Rise and revolution of Russia. Hist 145: the Old Regime, 800-1900. Hist 146: Revolution and Soviet rule since 1900. (Academic year—day)
- †147 **Economic History of Europe** (3) Sharkey
 Economic development since the Middle Ages; emphasis on the period following the Industrial Revolution. Evolution of capitalism and its impact upon the societies of Europe.
- 149-50 **European Diplomatic History** (3-3) McDonald
 The European state system; diplomatic practices and relations since the Congress of Vienna; emphasis on policies and actions of the great powers and their statesmen. Hist 149: to 1890. Hist 150: since 1890. Students cannot receive credit for both Hist 150 and 157. (Academic year—day)
- 151-52 **History of England and Great Britain** (3-3) Kenny
 Development of English civilization and its impact on Western culture. Hist 151: to 1689. Hist 152: since 1689. (Academic year—day)
- 153 **Tudor England** (3) Kenny
 Aspects of the constitutional, social, intellectual, and religious development of England, 1485-1603. (Fall—day)
- 154 **Stuart England** (3) Schwoerer
 Main currents from 1603 to 1714; emphasis on political, religious, social, and intellectual developments. (Spring—day)

* An interdepartmental course offered by the departments of History and Philosophy.
 † An interdepartmental course offered by the departments of History and Economics.

- 157 **20th Century European Diplomatic History** (3) Sachar
The main currents, with necessary 19th century background. Students cannot receive credit for both Hist 157 and 150. (Fall—day)
- 158 **Modern Jewish History** (3) Sachar
A secular history of the Jewish people from the 18th century to the present state of Israel, with particular emphasis on European political, economic, and cultural influences. (Spring—day)
- 162 **History of Spain and Portugal** (3) Rodríguez
Political, social, and cultural aspects.
- 163-64 **History of Latin America** (3-3) Rodríguez
Political, social, and cultural development. Hist 163: through independence. Hist 164: the national period. (Academic year—day)
- 165 **History of Brazil** (3) Rodríguez
Political, social, and cultural aspects.
- 166 **History of Mexico** (3) Staff
Political, social and cultural aspects.
- 167 **American Colonial History** (3) Haskett
Settlement of colonies, development of provincial institutions, and emergence of American civilization in the 17th and 18th centuries. (Spring—day)
- 169 **The American Revolution** (3) DePauw
The crisis of the British Empire after the Seven Years War, the War for Independence, the Confederation period, the making and ratification of the Federal Constitution. (Fall—day)
- 170 **U.S. Early National History** (3) Hill
Political, diplomatic, economic, and social history of the early republic, 1789-1828. (Spring—day)
- 171-72 **U.S. Social History** (3-3) Gray
Hist 171: daily life, institutions, intellectual and artistic achievements of the Agrarian Era, 1607-1861. Hist 172: the Urban-Industrial Era from 1861 to present. (Academic year—day)
- 173-74 **The Negro in American History** (3-3)
The place of Black Americans in the corpus of American history. (Academic year—day)
- 175-76 **U.S. Political History** (3-3) Haskett
Hist 175: to the Civil War. Hist 176: Civil War to New Deal. (Academic year—day)
- 177 **The Ante-bellum South** (3) DePauw
Development of the South as a section in the ante-bellum period. (Spring—day)
- 178 **The Civil War** (3)
Causative factors leading to Civil War; social, political, military, economic, and diplomatic aspects of the War; immediate and long-range effects on American life.

***179-80 U.S. Economic History (3-3)**

Process of economic growth from Colonial times to the present. Development of various sectors in the economy—such as agriculture, transportation, manufacturing, and banking—and their interdependence. Hist 179: 1607-1865. Hist 180: from 1865 to present. (Academic year—evening)

181-82 U.S. Diplomatic History (3-3)

Merriman, Hill

Tendencies toward isolation, expansion, and collectivism; disputes with foreign countries and their settlement; activities of American secretaries of state and diplomatic agents. Hist 181: to 1898. Hist 182: since 1898. (Hist 181: fall—day. Hist 182: spring—day and evening.)

183 Oversea Expansion of the United States (3)

Merriman

Political, economic, social, and cultural life of our outlying possessions. (Spring—day)

184 Canada and the United States (3)

Merriman

Historical background and main trends in the relationship of the two English-speaking peoples of North America.

185 Representative Americans (3)

Gray

Significant and pivotal personalities in government, business, science, religion, journalism, the arts, and social reform. (Fall—day)

187 History of Modern China (3)

Johnson

China since 1840, particular attention to political developments. (Fall—evening)

188 History of Chinese Communism (3)

Thornton

Survey of the leadership, ideology, structure, and operation of the Communist Party of China from its founding to the present. (Spring—day)

191-92 Senior Honors Thesis (3-3)

Staff

Required of and open only to undergraduate honors candidates in history. (Academic year)

193 History of the Near East (3)

Davison

Byzantine, Arab, Persian, and Islamic backgrounds; rise and decline of the Ottoman Empire; action of European powers in the area; Ottoman break-up into the Turkish Republic and other successor states. (Fall—day)

194 History of the Modern Near East (3)

Sachar

Beginning with Napoleon's invasion of Egypt. Interaction of Europe with western Asia, emphasis on such international issues as the Turkish Straits, Suez, Anglo-French imperialism; Turkish, Balkan, Arab, and Jewish nationalism, and the recent Soviet intrusion into the area.

195-96 History of East Asia (3-3)

Johnson

Civilizations of China and Japan; emphasis on cultural development and social organization. Hist 195: beginnings to about 1800. Hist 196: traditional societies on the eve of the modern era, their responses to Western cultural influences since mid-19th century. (Academic year—day)

* An interdepartmental course offered by the departments of History and Economics.

199 Proseminar: History and Historians (3)

Staff

(Formerly Proseminar: Readings for the History Major)

Required of senior history majors. Readings and discussions on major trends in the history of Western civilization in their world setting; representative selections from the classics of historical literature. Students cannot receive credit for both Hist 199 and 201. (Fall and spring—day)

THIRD GROUP

Prerequisite to all third-group History courses: the appropriate second-group preparation and consent of instructor.

201 History and Historians (3)

Staff

Students cannot receive credit for both Hist 201 and 199. (Fall and spring)

203-4 Research Seminar (3-3)

Staff

Prerequisite: Departmental approval. (Academic year)

205-6 Seminar: Modern History of Eastern Europe (3-3)

Petrov

East Central and Southeastern Europe in the 19th and 20th centuries. Hist 205: to the mid-1930's. Hist 206: to the communist take-over (1948). (Academic year—day)

207 Seminar: the Communist Party of the Soviet Union (3)

Ploss

Evolution of the communist movement of the Soviet Union. Comintern, Cominform, and other fundamentals of international communist organization. Selected case studies of individual congresses of the CPSU. (Spring—day)

208 Research Seminar: History of World Communism (3)

Thornton

(Fall—evening)

209-10 Seminar: Ancient History (3-3)

Hadley

Prerequisite: Hist 108, 109, or 110; or equivalent. (Academic year—day)

211-12 Seminar: Medieval History (3-3)

Andrews

Prerequisite: Hist 111-12 or equivalent. (Academic year—day)

***231 Seminar: Sino-Soviet Relations (3)**

Michael

Background, development, and status of conflict within the communist movement; emphasis on the role of Chinese communists. Prerequisite: 3 semester hours selected from Hist 187; P Sc 101, 194; or equivalent. (Spring—day)

237 Seminar: Soviet Foreign Policy, 1917-1953 (3)

Petrov

Revolutionary concept of diplomacy. Parallel instruments of foreign policy during the era of "capitalist encirclement," 1917-1939. From Nazi-Soviet partnership to the alliance with the West, 1939-1945. Foreign policies of the cold war, 1945-1953. (Fall—day)

* An interdepartmental course offered by the departments of History and Political Science.

- 241-42 **Research Seminar: Modern European History (3-3)** Herber
Prerequisite: appropriate preparation and consent of instructor. (Academic year—day)
- 245-46 **Research Seminar: Russian History (3-3)** Thompson
Prerequisite: Hist 145-46 or equivalent. (Hist 245: fall—day)
- 249-50 **Research Seminar: European Diplomatic History (3-3)** Davison
Prerequisite: Hist 149 or 150 or equivalent. Reading knowledge of French or German required. (Hist 249: fall—day)
- 251-52 **Research Seminar: English History (3-3)** Kenny, Schwoerer
Prerequisite: Hist 151-52 or equivalent. (Academic year—day)
- 261-62 **Research Seminar: Latin American History (3-3)** Rodríguez
Prerequisite: 6 semester hours selected from Hist 162, 163-64, 165, 166. (Academic year—evening)
- 271-72 **Research Seminar: U.S. Social History (3-3)** Gray
Prerequisite: Hist 171-72 or equivalent. (Hist 272: spring—day)
- *273-74 **Research Seminar: Materials in American Negro Culture (3-3)**
Prerequisite: Hist 173-74 or equivalent.
- 275-76 **Research Seminar: U.S. Political History (3-3)** Haskett
Prerequisite: Hist 175-76 or equivalent. (Academic year—day)
- 281-82 **Research Seminar: U.S. Diplomatic History (3-3)** Merriman
Prerequisite: Hist 181-82 or equivalent. (Academic year—day)
- 283-84 **Research Seminar: Recent U.S. History (3-3)** Hill
Prerequisite: 6 semester hours of 100-level American History courses.
- 285-86 **Research Seminar: Early American History, 1607-1828 (3-3)** Hill, DePauw
(Formerly Research Seminar: U.S. Early National Period)
Prerequisite: Hist 170, 175, or 181; or equivalent. (Academic year—day)
- 287 **Seminar: Problems in Latin American Civilization (3)** Rodríguez
Interdisciplinary seminar guided by a specialist within the methodology of his chosen discipline; each student writes a report on some aspect of a key theme (i.e., Nationalism) in Latin America's experience. Admission by permission of instructor. (Spring—day)
- 288 **Research Seminar: History of Chinese Communism (3)** Thornton
(Spring—evening)
- 291 **Research Seminar: 20th Century Problems—Era of World War I (3)** Sachar
(Fall—day)

* Offered jointly by the Department of History and the American Studies Program.

- 292 **Research Seminar: 20th Century Problems—Era of World War II** (3)
(Spring—day) Sachar
- 293-94 **Research Seminar: the Modern Near East** (3-3) Davison
Prerequisite: Hist 193 or equivalent. (Hist 294: spring—day)
- 295-96 **Research Seminar: the Modern Far East** (3-3) Johnson
Prerequisite: Hist 195-96 or equivalent. (Academic year—day)
- 299-300 **Thesis Research** (3-3) Staff
Required of all Master's candidates in history. (Academic year)

FOURTH GROUP

Prerequisite to all fourth-group History courses: the appropriate second-group preparation and consent of instructor.

Fourth-group History courses are limited to graduate students; but they are primarily for doctoral candidates.

- 311-12 **Readings in Medieval History** (3-3) Andrews
(Hist 312: spring)
- 341-42 **Readings in Modern European History** (3-3) Davison
(Hist 342: spring—day)
- 345-46 **Readings in Russian History** (3-3) Thompson
(Hist 346: spring—day)
- 351-52 **Readings in English History** (3-3) Schwoerer, Kenny
(Hist 352: spring—day)
- 361-62 **Readings in Latin American History** (3-3) Rodríguez
Gray
- 371-72 **Readings in American Social History** (3-3)
- 373-74 **Readings on the Negro in American Culture** (3-3) Haskett
(Academic year—day)
- 375-76 **Readings in U.S. Political History** (3-3) Sharkey
(Hist 375: fall—day)
- †379-80 **Readings in Economic History** (3-3) Merriman
(Academic year—evening)
- 381-82 **Readings in American Diplomatic History** (3-3) DePauw
(Hist 381: fall—day)
- 385-86 **Readings in Early U.S. History** (3-3)

* Offered jointly by the Department of History and the American Studies Program.
† An interdepartmental course offered by the departments of History and Economics.

- 387-88 **Readings in the History of Sino-Soviet Relations** (3-3) Thornton, Michael
(Hist 388: spring—evening)
- 395-96 **Readings in Modern Far Eastern History** (3-3) Johnson
(Hist 396: spring—day)
- 398 **Advanced Reading and Research** (arr.) Staff
Limited to students preparing for the Doctor of Philosophy general examination. May be repeated for credit. (Fall and spring)
- 399 **Dissertation Research** (arr.) Staff
Limited to Doctor of Philosophy candidates. May be repeated for credit. (Fall and spring)

Honors Program—Columbian College Lower Division

H.E. Yeide, Jr., *Coordinator*

Limited to selected freshmen and sophomores (see page 73).

FIRST GROUP

- 1 **Seminar: the Great Ideas of the West** (3)
Reading, discussion, and research involving works crucial to an understanding of the great Western ideas—their historical development and contemporary relevance. Examination of problems and categories that lie at the roots of most modern scholarly disciplines. (Spring—day)
- 21-22 **Seminar: Contemporary Problems** (3-3)
Reading, discussion, and research dealing with one major contemporary problem each semester, utilizing the perspectives and insights of various academic disciplines. (Academic year—day)
- 23 **Independent Honors Study** (3)
Admission by prior approval of Honors Program Advisory Committee. A major study project supervised by a faculty member. A significant paper or report required. (Spring)

Institute for Sino-Soviet Studies

MEMBERS OF THE INSTITUTE

F.H. Michael (*Director*), Anita Dasbach, C.F. Elliott, Andrew Gyorgy, H.C. Hinton, W.R. Johnson, W.H. Kraus, Kurt London, C.A. Moser, Vladimir Petrov, Sidney Ploss, Chung-wen Shih, R.B. Thompson, Richard Thornton, R.K. White, R.Y.C. Yin

ASSOCIATE MEMBERS OF THE INSTITUTE

Joseph Baclawski, Bernard Gordon, John Hardt, Tao-tai Hsia, C.A. Linden, Lothar Metzl, Bernard Ramundo, Philip True

The Institute for Sino-Soviet Studies offers specialized graduate study in the School of Public and International Affairs. Students who lack background in Soviet and Chinese studies are required to take undergraduate courses selected by the adviser as prerequisite to graduate work.

For description of the objectives and programs of the Institute, see pages 163-65.

ECONOMICS

267 Seminar: Soviet Economy (3)

Hardt

Development of the Soviet-type economy. Organization, policies, and problems: monetary, fiscal, production, allocative, foreign trade, economic growth. Workshop: case studies on sectoral or problem areas. Prerequisite: graduate status; Econ 101, 102, 133, and 134, or equivalent; and permission of instructor. (Fall—evening)

268 Seminar: Economic Theory and Development in Communist Countries (3)

Hardt

Appraisal of the Soviet-type model for economic development in the institutional framework of Soviet and other communist processes of economic development. Workshop: case studies on Eastern Europe, Chinese and other communist economies. Prerequisite: graduate status; Econ 101, 102, 133, and 134, or equivalent; and permission of instructor. (Spring—evening)

269 Economy of Communist China I (3)

Yin

Analysis of organization, operation, policies, and problems. Development of the economy under communism. (Fall—evening)

270 Economy of Communist China II (3)

Yin

Continuation of Econ 269, examining critical problems of development. Prerequisite: Econ 269 or permission of instructor. (Spring—evening)

GEOGRAPHY

265 Seminar: Geography of the Soviet Union (3)

Baclawski

Physical features, economic geography, natural and energy resources, industries. Soviet transportation system, agriculture, multinational population trends; emphasis on population patterns along borderlands, especially Sino-Soviet border. (Fall—evening)

266 Seminar: Geography of China (3)

True

Physical and economic geography; emerging industries, energy resources, transportation system. Emphasis on population "explosion"—its distribution and significance—and on regional geography, particularly on the Sino-Soviet border, Manchuria, Tibet, Mongolia, Inner Mongolia, and Sinkiang. (Spring—evening)

HISTORY

Prerequisite: appropriate preparation in second-group History courses and consent of instructor.

- 205-6 **Seminar: Modern History of Eastern Europe (3-3)** Petrov
East Central and Southeastern Europe in the 19th and 20th centuries.
Hist 205: to the mid-1930's. Hist 206: to the communist take-over (1948).
(Academic year—day)
- 207 **Seminar: the Communist Party of the Soviet Union (3)** Ploss
Evolution of the communist movement of the Soviet Union. Comintern,
Cominform, and other fundamentals of international communist organiza-
tion. Selected case studies of individual congresses of the CPSU.
(Spring—day)
- 208 **Research Seminar: History of World Communism (3)** Thornton
(Fall—evening)
- 237 **Seminar: Soviet Foreign Policy, 1917-1953 (3)** Petrov
Revolutionary concept of diplomacy. Parallel instruments of foreign
policy during the era of "capitalist encirclement," 1917-1939. From
Nazi-Soviet partnership to the alliance with the West, 1939-1945. For-
eign policies of the cold war, 1945-1953. (Fall—day)
- 245-46 **Research Seminar: Russian History (3-3)** Thompson
Prerequisite: Hist 145-46 or equivalent. (Hist 245: fall—day)
- 288 **Research Seminar: History of Chinese Communism (3)** Thornton
(Spring—evening)
- 295-96 **Research Seminar: the Modern Far East (3-3)** Johnson
Hist 295: social and intellectual revolution in Modern China; replace-
ment of scholar-gentry by 20th century intelligentsia. Emphasis on radi-
cal change after 1919. Hist 296: development of U. S. Far Eastern policy
since 1898; emphasis on coming of World War II and U. S. policy toward
China since 1941. Prerequisite: Hist 195-96 or equivalent. (Aca-
demic year—day)
- 345-46 **Readings in Russian History (3-3)** Thompson
Russian 19th and 20th century history. Emphasis on political and intel-
lectual movements reflecting the rise and fall of the revolutionary cycle.
(Hist 346: spring—day)
- 387-88 **Readings in the History of Sino-Soviet Relations (3-3)** Thornton
(Academic year—evening)

POLITICAL SCIENCE

- 215-16 **Seminar: the Communist Camp in World Politics I-II (3-3)**
P Sc 215: significant issues of communism, particularly in the Soviet
Union and Red China; concept and structure of "world socialist system";
intra-Bloc relations with emphasis on the Sino-Soviet dispute. Prerequi-
site: 3 semester hours in modern political theory. P Sc 216: political
ramifications of the communist movement and its relations with the non-
communist world. Prerequisite: 3 semester hours in international relations
or comparative government.
- 224 **Readings in Socialism and Communism (3)** Kraus
Readings and discussions of primary and secondary works to explore
genesis and transformations of a strand of political speculation from pre-

Marxian and Marxian socialism to contemporary Marxism-Leninism. Prerequisite: 3 semester hours in modern political theory. (Fall—day)

225 Seminar: Marxism-Leninism (3) Kraus

Crucial theoretical problems, such as the nature of revolution, dictatorship of the proletariat, transition to communism, imperialism, and national liberation in Marxian and contemporary communist doctrine. Prerequisite: P Sc 224 or permission of instructor. (Spring—evening)

227 Seminar: Government and Politics of Eastern Europe (3) Gyorgy

Comparative study of principal political, social, economic institutions; Soviet stake; patterns of Soviet domination; efforts toward economic and political integration; impact of the Sino-Soviet dispute; U. S. policy toward satellite nations. (Spring—day)

229 Readings in Soviet Government and Politics (3) Elliott

Readings in contemporary Soviet domestic government and politics. Prerequisite: 3 semester hours selected from Hist 146, P Sc 112, or equivalent. (Fall—evening)

230 Seminar: International Communism (3) Metzl

Fall semester: emphasis on operational techniques. *Spring semester:* case studies. Students may receive credit for the fall semester and also the spring semester, but neither semester may be repeated for credit. (Fall and spring—evening)

231 Seminar: Sino-Soviet Relations (3) Michael

Background, development, and status of conflict within the communist movement; emphasis on the role of Chinese communists. Prerequisite: 3 semester hours selected from Hist 187; P Sc 101, 194; or equivalent. (Spring—day)

232 Seminar: International Communications (3) Dasbach

East-West perspectives. Theory and history of national patterns of international communications focusing on basic political and psychological aspects of communication between major communist and noncommunist powers. (Spring—day)

233 Seminar: Soviet Government and Politics (3) Elliott

Research seminar in selected problems of Soviet domestic government and politics. Emphasis: since Stalin. Prerequisite: P Sc 229 or consent of instructor. (Spring—evening)

234 The Soviet Political Process (3) Ploss

Influence of revolutionary ideas, traditions, and accidental events on Soviet organization, and on administration of Soviet social, economic, national, and military policies; application of these policies by leaders to maintain power. (Fall—day)

***237 Chinese Law (3)** Hsia

Emphasis on the legal system of Communist China; analysis of the constitutional law of the People's Republic of China including general principles, state structure, and rights and duties of citizens; a brief survey of

* Same as Law 547 (2). Graduate students registering for P Sc 237 make special arrangements with the instructor for supplementary assignments equivalent to one additional semester hour.

the administration of justice—courts, procuratorates, and lawyers; marriage law, land law; counterrevolutionary act and other criminal statutes; principles of civil law; communist Chinese concept of international law.

*238 **Soviet Law (3)** Ramundo

Concept of "socialist legality"; legal relationship of individual to state and other participants in Soviet society; role of Party in Soviet legal system; Soviet philosophy of law; state (constitutional) law; Soviet federalism, governmental apparatus, rights and obligations of citizenship; criminal law; property law; labor law; selected topics in civil law and procedure; international law. (Fall)

253 **Seminar: Chinese Government and Politics (3)** Michael

Political institutions and concepts in late imperial times, during the revolution, under national government, and under communism. Emphasis on the communist period. Prerequisite: 3 semester hours selected from Hist 187; P Sc 101, 194; or equivalent. (Fall—day)

254 **Colloquium: Modern China (3)** Michael

Interuniversity research colloquium of faculty members of the Institute for Sino-Soviet Studies and other area universities from different disciplines concerned with the study of modern China. Critical discussions of research plans and studies in progress in weekly sessions. Advanced graduate students admitted with permission of faculty group. (Fall and spring—day)

255 **Colloquium: Russia and Eastern Europe (3)** Gyorgy

Interuniversity research colloquium of faculty members of the Institute for Sino-Soviet Studies and other area universities from different disciplines concerned with the study of Russia and Eastern Europe. Critical discussions of research plans and studies in progress in weekly sessions. Advanced graduate students admitted with permission of faculty group. (Fall and spring—day)

257 **Seminar: Communism in Developing Countries (3)**

Examination of international communist policy for, and communist parties in, developing countries. Case studies of Asia, Africa, and Latin America. Basic communist concepts of imperialism and nationalism; development and current application of Soviet and Chinese variants of strategy and tactics for "national liberation."

258 **Seminar: Communist Parties in the Noncommunist World (3)**

Movements and ideological variations of communist parties of France, Italy, the Scandinavian countries, and other Central and West European nations. Case studies on communist problems of Middle East and North African nations.

265-66 **Chinese Communist Policy Processes (3-3)** Hinton

Determinants of policy, view of the world, instrumentalities and locus power, interrelationship between domestic and foreign policy, formulation and implementation of policy. Prerequisite to P Sc 265: 3 semester hours selected from P Sc 101, 194, or equivalent. Prerequisite to P Sc 266: P Sc 265 or equivalent. P Sc 265: readings. P Sc 266: research seminar.

* Same as Law 546 (2). Graduate students registering for P Sc 238 make special arrangements with the instructor for supplementary assignments equivalent to one additional semester hour.

269 Seminar: Soviet Foreign Policy (3)

Elliott

External policies and relations of the USSR; world objectives of Soviet leaders; relations with other communist states, Western powers, and other countries; international propaganda, disarmament policy, foreign economic relations. Prerequisite: 3 semester hours selected from Hist 137, 145-46, or equivalent. (Spring—evening)

270 Political and Social Institutions of Eastern Europe (3)

Gyorgy

Major political and social factors which have shaped the inter-war, World War II, and post-war evolution of Eastern Europe. Emphasis on sociological and anthropological forces which have contributed to "Balkanization" of this area in the last fifty years. Each time the course is offered the concentration will be on one or two selected countries. (Fall—day)

274 Principles and Problems of International Political Communication (3)

Dasbach

Reading and discussion of public opinion/foreign policy relationships and operation of international political communication programs by major world powers as a tool of foreign policy. (Fall—day)

284 Seminar: Comparative Communist Systems (3)

Staff

A comparative examination of the major characteristics of communist systems—party history, structure, foreign policy, psychological influences, ideology, and modernization. Emphasis on methodological problems in comparative communist politics. (Spring—day)

288 Seminar: Soviet Military Policy and Strategy (3)

Staff

Soviet developments in military policy and strategy with attention to intra-Bloc military cooperation, political context of Soviet military policy, significant changes in recent Soviet military thought. (Fall or spring)

294 Seminar: Governments and Politics of Japan and Korea (3)

Readings, research, and discussion on contemporary political problems and relevant historical background of Japan, North and South Korea. (Fall or spring)

295 Seminar: Chinese Communist Foreign Policy (3)

Hinton

Objectives; formulation and implementation of foreign policy; Communist China as Asian state, revolutionary influence, would-be power. Prerequisite: 3 semester hours selected from P Sc 101, 194, or equivalent.

296 Seminar: the Communist Role in Far Eastern International Politics (3)

Hinton

Evolution of communist strategy for Asia, armed struggle in South and Southeast Asia, wooing of national bourgeoisie, development of Asian communist states, local communist parties since World War II, Sino-Soviet rivalry.

298 Southeast Asia in World Politics (3)

Gordon

Southeast Asia in great-power perspective. Overlapping and conflicting interests, foreign policies, and military requirements of the United States, Japan, China, and the USSR. Balance-of-power concept and development of Asian subsystem. (Spring—evening)

PSYCHOLOGY

- 259 Seminar: Social Psychology of Communism (3) White
Public and governmental opinion in communist countries, authoritarian thinking, communist propaganda, problems of Western communication with communist countries. (Fall—evening)

International Affairs

See "Public and International Affairs."

Italian

See "Romance Languages and Literatures."

Journalism

Professorial Lecturer F.L. Dennis
Associate Professors R.C. Willson (Chairman), Philip Robbins
Associate Professorial Lecturers H.L. Coppenbarger, T.R. Smith
Assistant Professorial Lecturers H.E. Paine, George Cheely, Shirley Elder, Arthur Settel, G.E. Trainor

Bachelor of Arts with a major in Journalism (Departmental).—Prerequisite: the Arts and Letters curriculum, page 78, including Engl 51-52 or 71-72, Hist 71-72 or P Sc 5-6, and Jour 71-72.

Required: the general requirements, pages 83-87, including I and II below.

I. Twenty-four hours of second group courses in Journalism, as follows: (a) Jour 111, 196, 198; (b) 9 hours chosen from Jour 121, 133, 137, 138, 139; (c) 6 hours chosen from Jour 115, 116, 117, 140, 145, 146, 151.

II. Twelve hours of second-group courses, chosen in consultation with the major adviser, in one other department of Columbian College of Arts and Sciences. Students selecting science may take courses in more than one department.

FIRST GROUP

71-72 Journalism in American Society (3-3) Willson

Jour 71: evolution of newspapers and other media in relation to political, social, and economic life; concept of press freedom. Jour 72: mass media, problems of contemporary journalism, emphasis on media-government relations. (Academic year—day and evening)

SECOND GROUP

111 Reporting (3) Robbins

Gathering, evaluating, and writing news. (Fall and spring—day)

- 115 Newspaper Editing and Make-up (3)** Coppenbarger
Preparation of news copy, pictures, and other graphic material for publication; evaluation of news; page layouts; newspaper make-up. (Spring—day)
- 116 Magazine Layout and Design (3)** Paine
Layout, typography, and design for magazines, newsletters, house organs, and similar publications for associations, institutions, and industry. (Fall—evening)
- 117 Magazine Editing (3)**
The editor's responsibility to publisher and readers. Setting the editorial goals and planning content and production to meet them. Editing copy for general and specialized magazines.
- 121 Feature Writing (3)** Willson
Free-lancing magazine articles, material obtained through independent investigation. (Fall—day)
- 125 Science Writing (3)**
Writing science news for the mass media.
- 133 Advanced Reporting: Community News (3)** Robbins
Coverage and writing of local news. (Fall—day)
- 137 Advanced Reporting: National Affairs (3)** Elder
Coverage and writing of federal government news from the point of view of the press association. (Spring—day)
- 138 Investigative Reporting (3)**
In-depth reporting in selected areas of political, economic, and social affairs.
- 139 Advanced Reporting: Radio and Television News (3)** Cheely
Preparing news and public affairs programs for broadcast media. (Spring—evening)
- 140 Photojournalism (3)** Smith
Photographic techniques affecting publication, illustration and story angle, standards of judgment in selection and use of pictures, captions, editing, technique, cropping for effective reproduction. (Spring—evening)
- 145 Principles and Problems of Public Relations (3)** Trainor
Principles, problems, and ethics of public relations for government agencies, commercial establishments, educational and other public institutions. Case histories of successful programs. (Fall—evening)
- 146 Government Information (3)** Settel
Growth of information activities in government and the role of the information specialist. Writing and editing for government information operations. (Spring—evening)
- 150 News Coverage in Washington (3)** Robbins
A survey of the way news is gathered and reported in the Nation's Capital by wire services, newspaper bureaus, and the local dailies. Field trips to major news centers; practice coverage.

- 151 **Editorial Writing (3)** Robbins
Writing editorials on public affairs. (Spring—day)
- 196 **Seminar (3)** Willson
For Journalism majors only. Research, individual and team writing of news, features, interpretative reports, and editorials on current major problem areas. (Spring)
- 198 **Law of the Press (3)** Dennis
Freedom of the press, censorship, legislative controls, publications as contempt of court, copyright, news gathering agencies, labor law and the newspaper business, law of libel, privileged matter, fair comment on public characters, right of privacy. (Fall—evening)

Latin American Studies

COMMITTEE ON LATIN AMERICAN STUDIES

Mario Rodríguez (*Chairman*), T.F. Carroll, Marvin Gordon, J.M. Howell, R.L. Humphrey, J.W. Robb, K.L. Storrs

Bachelor of Arts with a major in Latin American Studies (Interdepartmental).—Prerequisite: the Arts and Letters curriculum, page 78. The language requirement should be satisfied in Spanish.

Required: in addition to the general requirements, pages 83–87, (1) 18 semester hours distributed as follows: Anth 182 or 185, Geog 161, Hist 163–64, and 6 semester hours chosen from Span 151–52, 155–56, 157–58, or other approved courses; (2) 18 semester hours, including an interdisciplinary seminar (287), in one of the following areas: Anthropology, Economics, Geography and Regional Science, History, Political Science, or Hispanic Literature; (3) 24 semester hours of electives, chosen in consultation with an adviser.

Master of Arts in the field of Latin American Studies.—Prerequisite: a Bachelor's degree with a major in Latin American Studies, or equivalent. Majors in other fields may be considered for admission to Master's candidacy provided their undergraduate record includes sufficient course work in three of the following six areas: Anthropology, Economics, Geography and Regional Science, History, Political Science, and Hispanic Literature.

Required: in addition to the general requirements, pages 91–97, (1) a major emphasis of 12 semester hours of graduate work in one of six areas: Anthropology, Economics, Geography and Regional Science, History, Political Science, or Spanish American Literature; (2) two graduate seminars (6 semester hours each) in each of two of those areas not chosen for the major emphasis; (3) a thesis (299–300), 6 semester hours, in the area of major emphasis; (4) demonstration of proficiency in Spanish or Portuguese, or in English if the student's native language is Spanish or Portuguese; (5) the passing of a Master's Comprehensive Examination in the area of major emphasis and in the two minor areas.

Candidates for the degree of Doctor of Philosophy may elect Latin American History as an area of specialization in the field of History, Spanish American Literature as an area of specialization in the field of Romance Languages and Literatures, or Politics of Latin America as an area of specialization in the field of Political Science.

The following courses dealing with Latin America are currently available.

ANTHROPOLOGY

- | | |
|---|-----------|
| 170 <i>Cultures of the Caribbean</i> (3) | Simons |
| 171 <i>Native Peoples of North America</i> (3) | Humphrey |
| 172 <i>Native Peoples of South America</i> (3) | Staff |
| 182 <i>New World Archeology</i> (3) | Humphrey |
| 185 <i>Latin American Archeology</i> (3) | Humphrey |
| 282 <i>Seminar: Advanced Archeology—North American Prehistory</i> (3) | Staff |
| 287 <i>Seminar: Problems in Latin American Civilization</i> (3) | Rodríguez |

ECONOMICS

- | | |
|---|-----------|
| 185–86 <i>Economic History and Problems of Latin America</i> (3–3) | Howell |
| 233 <i>Seminar: Agrarian Reform and Development in Latin America</i> (3) | Carroll |
| 234 <i>Seminar: Evaluation of Rural Development Projects in Latin America</i> (3) | Carroll |
| 285–86 <i>Economic Development of Latin America</i> (3–3) | Staff |
| 287 <i>Seminar: Problems in Latin American Civilization</i> (3) | Rodríguez |

GEOGRAPHY AND REGIONAL SCIENCE

- | | |
|---|-----------|
| 127 <i>World Population and Settlement</i> (3) | Gordon |
| 161 <i>Latin America</i> (3) | Gordon |
| 287 <i>Seminar: Problems in Latin American Civilization</i> (3) | Rodríguez |

HISTORY

- | | |
|---|-----------|
| 162 <i>History of Spain and Portugal</i> (3) | Rodríguez |
| 163–64 <i>History of Latin America</i> (3–3) | Rodríguez |
| 165 <i>History of Brazil</i> (3) | Staff |
| 166 <i>History of Mexico</i> (3) | Rodríguez |
| 261–62 <i>Research Seminar: Latin American History</i> (3–3) | Rodríguez |
| 287 <i>Seminar: Problems in Latin American Civilization</i> (3) | Rodríguez |
| 361–62 <i>Readings in Latin American History</i> (3–3) | Rodríguez |

POLITICAL SCIENCE

- | | |
|--|-----------|
| 177 <i>Governments and Politics in Latin America</i> (3) | Storrs |
| 178 <i>Latin America: Political Patterns and International Relations</i> (3) | Storrs |
| 277–78 <i>Seminar: Latin American Politics</i> (3–3) | Storrs |
| 287 <i>Seminar: Problems in Latin American Civilization</i> (3) | Rodríguez |

SPANISH

- | | |
|--|------|
| 151–52 <i>The Spanish American Novel</i> (3–3) | Robb |
| 155–56 <i>Spanish American Literature to 1880</i> (3–3) | Robb |
| 157–58 <i>Spanish American Literature since 1880</i> (3–3) | Robb |
| 253 <i>Seminar: Studies in Modern Spanish American Poetry</i> (3) | Robb |
| 255 <i>Seminar: Studies in 20th Century Spanish American Theater</i> (3) | Robb |

256 Seminar: <i>Studies in Mexican Narrative Prose</i> (3)	Robb
261 Seminar: <i>Studies in Spanish American Essayists</i> (3)	Robb
264 Seminar: <i>Studies in Recent Spanish American Fiction</i> (3)	Robb
266 Seminar: <i>Alfonso Reyes</i> (3)	Robb
287 Seminar: <i>Problems in Latin American Civilization</i> (3)	Rodríguez

Linguistics—Graduate Study

COMMITTEE ON LINGUISTIC STUDY 1969-70

J.G. Allee, Jr., J.A. Frey, V.K. Golla, J.W. Hillis, J.C. King (*Acting Chairman*), R.K. Lewis, J.N. Mosél, David Nelson, Helen Yakobson

Master of Arts in the field of Linguistics.—An interdepartmental degree, directed by the Committee on Linguistic Study. Interested students should consult the Chairman of this Committee.

Prerequisite: a Bachelor's degree with a major (with a grade of high B or above) in one of the following, or equivalent. (1) An undergraduate major in French, German, Russian, or Spanish. (2) An undergraduate major in Anthropology, English, Linguistics, Mathematics, Philosophy, Psychology, Speech, or Statistics, together with a proficiency in French, German, Russian, or Spanish. (3) An undergraduate major in Education with a teaching field in French, German, Russian, or Spanish. (4) An undergraduate major in Education with a teaching field in English, Mathematics, or Speech, together with a proficiency in French, German, Russian, or Spanish.

Required: the general requirements, pages 91-97. The 30 semester hours must include 24 semester hours of course work as outlined in Groups I, II, and III, below, plus a thesis (equivalent to 6 semester hours).

Group I—15 semester hours consisting of Anth 162; 3 semester hours of the Structure of Modern English; Germ 227-28; plus 3 semester hours selected from Anth 161, Engl 115, Psyc 115, or Sp&D 176.

Group II—6 semester hours selected from Anth 193, 261; Engl 213-14; Fren 212, 213-14; Germ 201-2, 205-6, 209-10, 213-14, 223-24, 225-26; Slav 125, 126, 206, 215-16; Span 215-16. With the approval of the adviser students may substitute, if not previously elected, courses from Group I.

Group III—3 semester hours selected from Chin 123-24; Math 101, 102, 122, 123, 201-2; Phil 221; Psyc 289; Sp&D 101, 279, 284, 291, 292, 295; Stat 131, 161-62. With the approval of the adviser students may substitute, if not previously elected, courses from Groups I and II.

There is no undergraduate major in the field of Linguistics.

Students may elect Linguistics in the fields of Germanic Languages and Literatures and Romance Languages and Literatures toward the degree of Doctor of Philosophy.

Graduate students are urged to consult the Committee on Linguistic Study and the appropriate catalogues concerning courses which can be taken under the agreement for the Consortium of Universities of the Washington Metropolitan Area, Inc.

ANTHROPOLOGY

161 <i>Language and Culture</i> (3)	Golla
162 <i>Linguistics in Anthropology</i> (3)	Golla
193 <i>Anthropological Methods</i> (3)	Krulfeld
261 <i>Field Methods in Linguistics</i> (3)	Golla

CHINESE LANGUAGE AND LITERATURE

123-24 *Introduction to Chinese Linguistics* (3-3)

Staff

ENGLISH

115 *Introduction to English Linguistics* (3)

Allee

213-14 *Old English* (3-3)

Allee

GERMANIC LANGUAGES AND LITERATURES

201-2 *Middle High German* (3-3)

Legner

205-6 *Gothic* (3-3)

Legner

209-10 *Old High German* (3-3)

King

213-14 *Old Norse* (3-3)

Allee

223-24 *Linguistic Analysis of Modern German* (3-3)

King

225-26 *Seminar: Linguistics* (3-3)

King, Allee

227-28 *Sanskrit—Introduction to Indo-European Linguistics* (3-3)

King

MATHEMATICS

101 *Introduction to Mathematical Logic* (3)

Nelson

102 *Axiomatic Set Theory* (3)

Nelson

122 *Introduction to Abstract Algebra* (3)

Lee and Staff

123 *Linear Algebra* (3)

Lee and Staff

201-2 *Mathematical Logic* (3-3)

Nelson

PHILOSOPHY

221 *Seminar: Logical Theory*

Griffith

PSYCHOLOGY

115 *Psychology of Language and Communication* (3)

Mosel

289 *Seminar: Current Topics in Experimental Psychology* (3)

Staff

ROMANCE LANGUAGES AND LITERATURES

FRENCH

212 *Historical French Grammar* (3)

Mudge

213-14 *Medieval French Literature* (3-3)

Mudge

SPANISH

215-16 *Old Spanish* (3-3)

Neyman

SLAVIC LANGUAGES AND LITERATURES

125 *Russian Linguistic Structure I* (3)

Thompson

126 *Russian Linguistic Structure II* (3)

Thompson

206 *Old Russian Literature* (3)

Mosser

215-16 *History of the Russian Literary Language* (3-3)

Mosser

SPEECH AND DRAMA

101 <i>Phonetics</i> (3)	Majerus
176 <i>Speech, Hearing, and Language Development</i> (3)	
279 <i>Anatomy and Physiology of Speech and Hearing</i> (3)	Bowling
284 <i>Experimental Phonetics</i> (3)	Hillis
291 <i>Seminar: Speech Pathology</i> (3)	Staff
292 <i>Seminar: Audiology</i> (3)	Staff
295 <i>Independent Research in Speech and Hearing</i> (arr.)	Staff

STATISTICS

131 <i>Contingency Table Techniques</i> (3)	Kullback
161-62 <i>Information Theory</i> (3-3)	Kullback

Management Science*

Professors R.F. Ericson, G.L. Lippitt, D.D. Roman, Roy Herrmann (*Visiting*),
 Edwin Timbers
 Professorial Lecturers C.W. Clewlow, M.H. Schwartz, Jerome Bracken
 Associate Professors J.F. McCarthy, Jr., M.M. Wofsey, G.R. Allen, R.L. Hol-
 land (*Chairman*), L.H. Mantell, E.K. Winslow, D.P. Boyd
 Adjunct Associate Professor H.C. Demoody
 Associate Professorial Lecturers L.B. Pouliot, J.C. Susbauer
 Assistant Professors Elizabeth Adams, J.W. Waldrip, W.E. Smith
 Assistant Professorial Lecturers N.R. Harbaugh, D.E. Hovey, F.L. Cundari,
 W.H. Farthing

THIRD GROUP

- 201 **Advanced Administrative Management** (3) Eastin, Brown
 Advanced course in administration emphasizing principles and practices
 common to administrative units of all kinds. (Fall and spring—day
 and evening)
- 203 **Mathematics for Management** (3) Hermann, Holland, Paik, Boyd
 Mathematical concepts employed in the solution of management prob-
 lems. Applications of analytical geometry, functions, elements of calculus,
 and linear algebra to optimization problems. Prerequisite: algebra.
 (Fall—day and evening; spring—evening)
- 204 **Quantitative Factors in Administration** (3) Herrmann,
 Holland, Paik, Boyd
 Survey of quantitative techniques used in the solution of management
 problems. Potentials and limitations of mathematical models and proper
 areas for their application. Topics include probability, statistical decision
 theory, linear programming, waiting line, inventory replacement models.
 (Fall and spring—day and evening)

* Prior to the fall semester 1970-71 the Management Science courses listed here were Business and Public Administration courses.

- 207 Human Behavior in Organizations (3)** Lippitt, Winslow
Individual, group, intergroup, and other human behavior and development; application of social science research to administration. Practical applications emphasized. (Fall and spring—day and evening)
- 208 Current Issues in Organizational Behavior (3)** Lippitt, Winslow
Study of behavioral factors relating to issues such as automation, ethics, labor-management relations, and similar problems. Problems in behavioral science research. Prerequisite: Mgt 207. (Fall—day; spring—evening)
- 209 Colloquium on Behavioral Sciences (3)** Lippitt
Primarily for doctoral students. Supervised study in depth and field projects in the behavioral sciences. Prerequisite: Mgt 207 or permission of instructor. (Fall—day)
- 210 Behavioral Factors in the Process of Change (3)** Lippitt
Current research and theory related to the process of change. Basic principles of planned change; individual, group, organization, community, and cultural change. Human behavior research related to the change process emphasized. Prerequisite: Mgt 207 and 208. (Spring—evening)
- 211 Leadership and Executive Development (3)** Grub, Loeser
Theories of managerial leadership; issues and problems associated with leadership in large organizations and at higher management levels; executive selection and development. Prerequisite: Mgt 201 or permission of instructor. (Fall and spring—evening)
- 218 Survey of Data Processing (3)** McCarthy, Wofsey, Demoody, Adams
Fundamentals of automatic data processing; manual, punched card, and electronic data processing principles and procedures; basic machine language and advanced language programming techniques; phases of data systems development; role of the manager in management information systems. Emphasis on proper use of data processing as another tool of management. (Fall and spring—day and evening)
- 219 Digital Computer Programming Concepts (3)** Allen, W. Smith
Programming concepts, techniques, and practices; FORTRAN and COBOL; address modifications, indexing, sub-routines, sub-programs, table look-up, machine functions, data representation, instruction formatting, and programming systems; government- and business-oriented problems. Student programs are run on the University 360 computer. Students will not become programmers, but will understand the use of programming in management information systems. Prerequisite: Mgt 218 or permission of instructor. (Fall and spring—evening)
- 220 Comparative Digital Computer Systems and Their Management (3)** Wofsey, Schwartz
Characteristics and capacities of the range of data processing equipment in use today, special purpose equipment in business and government, recent and prospective equipment developments. Fundamentals of data processing installation design and management. Prerequisite: Mgt 218 or 219, or permission of instructor. (Fall and spring—evening)

221 Management Information Systems Development and Application (3) McCarthy

Development of management information systems, integration of data processing in operations of government or business, impact on management organization and decision making. Case studies. Prerequisite: Mgt 218 or 219, 224; or permission of instructor. (Fall—evening; spring—day and evening)

222 Seminar: Advanced Digital Computer Concepts (3) Wofsey, Allen

Advanced problems in the design and application of computer systems. Admission by permission of instructor. (Fall and spring—evening)

223 Management of a Data Processing Organization (3) Adams

Organization and management of data processing function in business and government; study of types of resources required: planning, scheduling, and production of data processing workloads; performance standards; evaluation criteria. Prerequisite: Mgt 218 and either 219 or 220; or permission of instructor. (Fall and spring—evening)

224 Theory and Management of Systems (3) Ericson, Mantell

Advanced course in systems, emphasizing systems theory and the capacities, capabilities, and management of current, large systems. Analysis of components and elements of systems and their association with management concepts. Applications; various techniques and potential problems for implementation. Systems of the future are projected with consideration of quantitative and technological developments. Particular emphasis on computer-based and communications-oriented systems. Prerequisite: Mgt 201, 204. (Fall—evening)

225 Introduction to Managerial Statistics (3) Boyd

Introduction to the mathematics of probability and statistics and its applications in management science and operations research. Topics include random variables; discrete and continuous probability distributions; moments and other descriptive measures; sampling theory; and an introduction to statistical estimation, hypothesis testing, and regression analysis. Prerequisite: Mgt 203 or equivalent. (Fall—evening)

226 Managerial Statistics (3) Boyd

Management applications of the theory and techniques of mathematical statistics. Topics include maximum likelihood and other methods of estimation, hypothesis testing, descriptive measures of bivariate distributions, regression and correlation, analysis of time series, econometric models and multiple regression, statistical decision theory, and the revision of probabilities in decision making. Prerequisite: Mgt 225. (Spring—evening)

227 Mathematical Programming: Techniques and Applications (3) Bracken

Technical and management considerations of linear and nonlinear programming. Mathematical and computational aspects of linear programming. Formulation of linear programming models. Studies of applications of linear programming. Introduction to theory and application of nonlinear programming. Prerequisite: Mgt 203 or equivalent. (Fall—evening)

- 228 Systems Analysis by Simulation (3)** Bracken, Holland
Methods of systems analysis via computer simulation. Particular attention to inventory models, although queueing systems and management planning models are also covered. Prerequisite: Mgt 225, 226.
- 229 Seminar: Management Science and Operations Research (3)** Bracken, Herrmann
Supervised study in depth and advanced projects in management science and operations research. Prerequisite: Mgt 225, 226, 227; or permission of instructor. (Spring—evening)
- 230 Seminar: Administration of Research and Development (3)** D. Roman
Individual and/or group in-depth research projects dealing with various phases of Research and Development management. Topic will vary each time the course is offered according to the emerging technology, current operational problems, and student interest. Prerequisite: 6 to 9 semester hours of Research and Development management or permission of instructor. (Fall—evening)
- 262 Seminar: Contemporary Administrative Theory (3)** Ericson
Primarily for doctoral students. An overview of current and prospective theory and practice from an inter- and trans-disciplinary viewpoint. Topics addressed include general systems theory, game theory, axiology and management values, antithetics, value engineering, cybernetic systems, decision theory, innovation and creativity models, and general semantics. Prerequisite: Mgt 201, 204, 207. (Fall—day; spring—evening)
- 263 Organization and Management (3)** Ericson
Contemporary management theory; emphasis on application of management concepts in organizational practice. Comparative studies of current organizational designs and management processes. Prerequisite: Mgt 201, 204, 207.
- 268 Management Engineering (3)** Clewlow
Analysis of the techniques for initiation and implementation of management engineering programs; emphasis on organization and methods surveys, including the study of work measurement, work simplification, management audits, and other management improvement programs. (Fall and spring—evening)
- 287 Relations of Government to Business (3)** Timbers
Legal foundations of the power of government to regulate and promote business, regulatory and promotional activities of the government, functions of the independent regulatory agencies, antitrust activities of government, monetary and fiscal policy, and government regulation of labor-management relations. (Spring—day)
- 290 Conferences: Government and Business Administration (arr.)**
Lecture and conference series; distinguished visiting professors, speakers from government and business. (Spring)
- 295 Research Methods (3)**
Research techniques, sources of information, array and analysis of data, interpretation and presentation of the findings. (Spring)

Mathematics

Professors David Nelson, T.P.G. Liverman, Hewitt Kenyon (*Chairman*), C.T. Taam

Professorial Lecturers D.M. Dribin, Joseph Blum, B.J. McDonald, A.B. Willcox

Associate Professors W.A. Smith, Dagmar Henney, Irving Katz, I.I. Glick, M.D. Green

Associate Professorial Lecturers Emanuel Vegh, N.P. Callas, R.L. Eisenman, D.C. Peterson

Assistant Professors Ruth Bari, E.A. Stone, Myrna Lee

Assistant Professorial Lecturers Mabel Morris, Donald Boyer, J.K. Minichiello

Instructor James McPherson

Bachelor of Arts or Bachelor of Science with a Major in Applied Mathematics (Departmental).—Prerequisite: the Arts and Letters or the Science curriculum, respectively, pages 78–79, including Math 31, 32, 33, and 34.

Required: the general requirements, pages 83–87. The 60 semester hours required for graduation are distributed as follows:

I. Thirty semester hours of Mathematics and Statistics courses, as follows: Math 111, 112, 139, 140, 181–82; Stat 189–90; and 6 semester hours chosen from second- and third-group Mathematics and Statistics courses, in consultation with the adviser.

II. Eighteen semester hours to be selected, in consultation with the adviser, from the following Areas of Application (A, B, or C below). At least 12 semester hours must be chosen from one Area, and the other 6 semester hours must be chosen from courses numbered 101 or higher. For courses in Civil Engineering, Electrical Engineering, Engineering Administration, Measurement Science, and Mechanical Engineering, see the *School of Engineering and Applied Science* catalogue.

A. Social and Management Sciences—courses chosen from CE 183, 195, 197; Econ 1–2, 101, 102, 123, 199; E Ad 115, 140, 261, 269, 270, 272, 273, 275, 276, 277, 278, 279, 281–82, 283, 284, 296; EE 184, 283, 284, 285; Math 101, 102, 113, 124; Stat 113, 117, 118, 131, 157–58, 161–62, 165–66, 188, 197.

B. Engineering and Physical Sciences—courses chosen from Chem 111–12, 113; CE 120, 121–22, 140, 166, 167, 168, 181, 185, 186, 190, 191–92, 193, 196, 198, 201, 202, 203, 204, 205, 206, 207, 210, 212, 213, 220, 223, 252, 253, 254, 255, 256, 258, 263, 264, 275; Stat 107, 117, 118, 131, 157–58, 197; and any course offering in Electrical Engineering, Measurement Science, Mechanical Engineering, or Physics.

C. Computing Sciences—courses chosen from EE 152, 153, 154, 157, 158; Math 102, 113, 124, 142, 153, 154, 157; Stat 113, 157–58, 161–62, 165–66, 197.

III. Twelve semester hours of electives.

Bachelor of Arts or Bachelor of Science with a major in Mathematics (Departmental).—Prerequisite: the Arts and Letters or the Science curriculum, respectively, pages 78–79.

Required: in addition to the general requirements, pages 83–87, 24 semester hours of approved second- and third-group Mathematics courses.

Master of Arts in the field of Mathematics.—Prerequisite: a Bachelor's degree with a major in Mathematics at this University, or equivalent.

Required: the general requirements, pages 91–97. Students must complete either (1) 30 semester hours of approved course work, including Math 299–300 *Thesis Research* or (2) 36 semester hours of approved course work.

Doctor of Philosophy fields of study in Mathematics: Functional Analysis (Abstract Differential Equations, Functional Equations, Generalized Functions, Groups of Operators) Linear Algebra (Matrix Theory), Logic, Measure and Integration, Ordinary and Partial Differential Equations, Theory of Numbers, and Topology (General Topology, Analytic Topology, Topological Groups).—See pages 91–95, 97–99, for requirements for the degree.

Bachelor of Arts in Education with a teaching field in Mathematics.—Prerequisite: the Education curriculum, page 80.

Required: the Mathematics option and the professional courses listed on pages 112, 115–16.

Placement Examination: new students registering for Math 30 are required, prior to registration, to take a placement examination in algebra and trigonometry.

Departmental prerequisite: Math 24 or 33 is prerequisite to all second-group courses in Mathematics. Exception to this regulation may be made for Math 101, 122, and 124. Students anticipating a substantial concentration in Mathematics should consult with the Department about early completion of these courses.

FIRST GROUP

3 College Algebra (3)

Equivalent to second-year high school algebra. Prerequisite: one year each of high school algebra and high school geometry. (Fall and spring—day and evening) Morris and Staff

6 Plane Trigonometry (3)

Prerequisite: two years of high school algebra and one year of high school geometry, or Math 3 (or concurrent registration therefor). (Fall and spring—day and evening) Morris and Staff

9 General Mathematics I (3)

For students electing Math 9 and 10 as a terminal sequence. Logic, sets, number systems. Prerequisite: two years of high school mathematics. (Fall and spring—day and evening) Smith and Staff

10 General Mathematics II (3)

Statistics and probability, exponents and logarithms, trigonometry. Prerequisite: Math 9. (Fall—evening; spring—day and evening) Smith and Staff

15 Finite Mathematics I (3)

Introduction to logic, sets, and probability. Prerequisite: two years of high school mathematics. (Fall—day; spring—evening) McPherson and Staff

16 Finite Mathematics II (3)

Vectors and matrices, mathematics of finance and accounting, linear programming, introduction to game theory. Prerequisite: Math 15. (Spring—evening) McPherson and Staff

19 Geometry from a Modern Viewpoint (3)

Open only to District of Columbia teachers participating in an In-service Institute supported by the National Science Foundation. (Fall—late afternoon) Smith and Staff

24 Calculus IV (3)

Solid geometry, multiple integration and partial differentiation with applications, line and surface integrals, differential equations. Prerequisite: former Math 23. (Offered last time fall 1970–71—day and evening) Green and Staff

30 Precalculus (3) **Bari and Staff**

Logic, set theory, real number system, inequalities, basic analytic geometry, functions and relations. Polynomial, trigonometric, logarithmic, and exponential functions. Prerequisite: Math 3 and 6; or one and one-half years of high school algebra, one year of high school geometry, and one-half year of high school trigonometry; or equivalent. (Fall and spring—day and evening)

31 Calculus of One Variable (3) **Green and Staff**

Differentiation and integration of algebraic and elementary transcendental functions, with simple applications. Prerequisite: Math 30 or equivalent.* (Fall and spring—day and evening)

32 Calculus of Several Variables (3) **Green and Staff**

Partial derivatives, multiple integrals, infinite series. Prerequisite: Math 31. (Fall and spring—day and evening)

33 Calculus of Vector Functions (3) **Green and Staff**

Elementary linear algebra, vectors, and matrices. Vector calculus, implicit function theory. Prerequisite: Math 32. (Fall and spring—day and evening)

34 Introduction to Linear Algebra (3) **Green and Staff**

Linear functions, solutions of equations, dimension and rank, determinants, eigenvalues, quadratic forms, change of basis. Prerequisite: Math 31 or permission of instructor. (Fall and spring—evening)

SECOND GROUP

101 Introduction to Mathematical Logic (3) **Nelson**

Introduction to proof theory and model theory of propositional and predicate calculi, computability, topics from foundations of mathematics.

102 Axiomatic Set Theory (3) **Nelson**

Zermelo-Fraenkel set theory, ordinals and cardinals, foundations of the real number system. Prerequisite: Math 101 or permission of instructor. (1971-72 and alternate years)

106 Introduction to Topology (3) **Green**

Prerequisite: Math 139 or permission of instructor. (Spring—evening)

107 Introduction to Algebraic Topology (3) **Bari**

Prerequisite: Math 122 and 139, or permission of instructor.

111 Mathematics for Engineers and Physicists I (3) **Liverman and Staff**

Differential equations, linear algebra. (Fall—evening)

112 Mathematics for Engineers and Physicists II (3) **Liverman and Staff**

Fourier series, Laplace transformation, partial differential equations. Prerequisite: Math 111. (Spring—evening)

* Math 30 may be waived as a prerequisite requirement by examination on scheduled dates.

- 113 Graph Theory (3)** Staff
 Directed and undirected graphs; unicursal graphs; shortest paths; Hamilton circuits; incidence, circuit, and cut-set matrix relations; coloring problems; network flow.
- 120 Introduction to Theory of Numbers (3)** Lee
 Prerequisite: Math 122 or equivalent. (Fall—evening)
- 122 Introduction to Abstract Algebra (3)** Lee and Staff
 (Fall—evening; spring—day)
- 123 Linear Algebra (3)** Lee and Staff
 Prerequisite: Math 122. (Spring—evening)
- 124 Introduction to Matrix Theory (3)** Lee and Staff
 Elementary theory of finite vector spaces, determinants, equivalence, matrices with polynomial elements, similarity of matrices. (Fall—evening)
- 127 Foundations of Geometry (3)** Non-Blum
 Alternative postulational developments of Euclidean geometry. Euclidean geometries.
- 134 Introduction to Boundary Value Problems (3)** Blum
 Prerequisite: Math 111 or 142. (Spring—evening)
- 135 Projective Geometry (3)** Dribin
 Prerequisite: Math 123 or 124, or equivalent. (Fall—evening)
- 139 Advanced Calculus I (3)** Liverman and Staff
 Review and extension of elementary one-variable calculus, emphasis on the theoretical foundations. (Fall and spring—evening)
- 140 Advanced Calculus II (3)** Liverman and Staff
 Calculus of several variables. Prerequisite: Math 139 or equivalent. (Spring—evening)
- 142 Theory of Differential Equations (3)** Staff
 Prerequisite: Math 139. (Fall—evening)
- 153 Introduction to Numerical Analysis (3)** McDonald
 Introduction to fundamentals of numerical analysis using modern digital computers. Solution of linear systems and of ordinary differential equations. Interpolation polynomials, iterative solution of nonlinear equations, simple quadrature techniques. Prerequisite: Math 111 or 139, or equivalent. (Fall—evening)
- 154 Difference Equations (3)** McDonald
 Introduction to finite difference equations and their solution. Physical examples and analogies with differential equations are employed to motivate and supply the techniques developed. Generating functions, analysis of error and stability characters. Prerequisite: Math 111 or 139, or equivalent. (Spring—evening)
- 157 Introduction to Complex Variable Theory (3)** Staff
 Prerequisite: Math 139. (Spring—evening)

181-82 Seminar: Applied Mathematics (3-3)

191 Special Topics (arr.) Staff

Admission by permission of instructor. May be repeated for credit.
(Fall or spring)

195 Reading and Research (arr.) Staff

Under the personal direction of an instructor. Limited to Mathematics and Applied Mathematics majors with demonstrated capacity. Prior approval of instructor required. May be repeated for credit. (Fall or spring)

THIRD GROUP

201-2 Mathematical Logic (3-3) Nelson

(1971-72 and alternate years)

220 Theory of Numbers (3) Lee

Prerequisite: Math 120 or equivalent. (Spring—late afternoon)

237-38 Theory of Functions of a Complex Variable (3-3) Staff

(Academic year—evening)

239-40 Ordinary Differential Equations (3-3) Glick

(Academic year—evening)

243-44 Numerical Analysis (3-3) McDonald

Elements of theory and practice of numerical analysis using modern digital computers. Solution of linear systems and nonlinear equations, computation of eigenvalues and eigenvectors, basic approximation theory, interpolation techniques, numerical quadrature, solution of differential equations. Prerequisite: Math 124, 111 or 139; or equivalent.

250 Measure and Integration (3) Taam

Lebesgue measure and integration, measure and integration in abstract spaces, the Daniell integral. (Fall—late afternoon)

251-52 Real and Abstract Analysis (3-3) Liverman

Elements of topology; filters, compactness, metric spaces. Continuity and double limits. Banach and Hilbert spaces. Vector to vector functions; implicit function theorem. Prerequisite: Math 106, 123, and 140; or equivalent. (Academic year—evening)

255 Differential Geometry (3) Dribin

(Fall—evening)

256 Introduction to Algebraic Geometry (3) Dribin

(1971-72 and alternate years)

257 Lie Groups (3)

258 Group Representations (3) Lee

(1971-72 and alternate years)

259 Advanced Topics in Group Theory (3) Katz

- 261-62 **Principles and Methods of Applied Mathematics (3-3)** Liverman
(Formerly Theory and Application of Generalized Functions)
 Definition of distributions of Schwartz and Gelfand-Silov. Operational and integral transform methods applied to the existence theory and explicit solution of ordinary and partial differential equation problems of mathematical physics. Structure of distributions and ultradistributions. Schwartz kernel theorems. Engineering and physics applications. Prerequisite: Math 124, 140, and 157; or permission of instructor. (1971-72 and alternate years)
- 265-66 **Modern Algebra (3-3)** Lee
 Fundamental concepts of theory of groups, rings, and fields; theory of finite fields, extension fields, Galois groups, factorization theory in Gaussian domains and groups with operators. Prerequisite: Math 123 or equivalent. (Academic year—evening)
- 267 **Topics in Matrix Theory (3)** Katz
 Theory of linear transformations (vector spaces over a division ring), advanced classical theory, matrix representation of groups and rings, special topics as time allows. Prerequisite: Math 123 and an elementary knowledge of groups, rings, and fields.
- 270 **Tensor Analysis (3)** Glick
- 277 **Partial Differential Equations (3)** Glick
 (Spring—evening)
- 281-82 **General Topology (3-3)** Stone
 (Academic year—evening)
- 285 **Algebraic Topology (3)** Bari
- 287-88 **Functional Analysis (3-3)** Taam
 Fundamental results of functional analysis. Students participate in classroom presentation and discussion. Topics include abstract integration and measure theory, linear topological spaces, Hilbert and Banach spaces, weak topology, Bochner's integral, Banach algebras and application to spectral representation, semi-groups of operators, differential equations in Banach spaces. Prerequisite: Math 238, 250, and 106 or 251; or equivalent. (1971-72 and alternate years)
- 289-90 **Topics in Functional Analysis and Applications (3-3)** Taam
 Qualified students encouraged to work with instructor on research projects. Topics selected to serve research interests of instructor and students. Prerequisite: Math 288 or equivalent. (Academic year—evening)
- 291-92 **Seminar (3-3)** Staff
 (Academic year)
- 295 **Reading and Research (3)** Staff
 May be repeated once for credit. (Fall and spring)
- 299-300 **Thesis Research (3-3)** Staff
 (Academic year)

FOURTH GROUP

398 Advanced Reading and Research (arr.) Staff

Limited to students preparing for the Doctor of Philosophy general examination. May be repeated for credit. (Fall and spring)

399 Dissertation Research (arr.) Staff

Limited to Doctor of Philosophy candidates. May be repeated for credit. (Fall and spring)

Microbiology

Professors A.M. Griffin, Mary Louise Robbins, R.C. Parlett (*Chairman*), L.J. Griffith (*Visiting*), Rudolph Hugh
 Professorial Lecturers F.B. Gordon (*Virology*), Dorothy Heilman (*Cellular Immunology*), M.S. Legator (*Microbial Genetics*), E.M. Lerner II
 Associate Professors L.F. Affronti, Melvin Reich
 Assistant Professors G.L. Wright, Jr., Yang-Ming Chu, Kun-yen Huang
 Assistant Professorial Lecturers P.J. Price, Rosalie De Giovanni-Donnelly, M.H. Cohen

Master of Science in the field of Microbiology.—Prerequisite: a Bachelor's degree from this University, or equivalent, with a major in Biology, Botany, Chemistry, or Zoology. The undergraduate program must have included the following courses or equivalent: B Sc 11-12; Chem 11-12, 51-52, 53-54; Math 30, 31 (31 may be taken concurrently with the graduate program), or former Math 21, 22; Phys 1, 2.

Required: the general requirements, pages 91-97. The 30 semester hours of course work must include Micr 201 (if not presented for admission), plus 220, 277-78, 299-300, Epid 230, and Bioc 221-22. The remaining academic work should consist of graduate-level courses selected with the approval of the instructor.

Master of Science in the field of Mycology.—An interdepartmental degree offered by the departments of Biochemistry, Epidemiology and Environmental Health, and Microbiology.

Prerequisite: a Bachelor's degree with a major in Biology, Botany, Chemistry, or Zoology, from this University; or equivalent. The undergraduate program should have included the following courses, or equivalent: B Sc 11-12; Chem 11-12, 51-52, 53-54.

Required: the general requirements, pages 91-97. The 33 semester hours required in this program must include Bioc 221-22; Epid 201, 217, 230; Micr 201, 225, 231; and Thesis Research (299-300).

Doctor of Philosophy fields of study in Microbiology: Determinative Bacteriology, Immunochimistry, Immunology, Microbial Genetics, Microbial Pharmacology, Microbial Physiology, and Virology.—See pages 91-95, 97-99, for requirements for the degree.

201 Medical Microbiology (6) Parlett and Staff

Bacteria, rickettsiae, viruses, yeasts, molds, protozoa, metazoa which relate to the health and disease of man—cultural studies, methods of diagnoses, theories. Laboratory fee, \$16. (Spring)

214 Tissue Cell Culture and Somatic Variation (4) Chu, Price

Techniques of tissue culture and means of studying somatic variations. Prerequisite: Micr 201 or equivalent. (Spring—day)

- 220 Scientific Writing for Graduate Students (1)** Robbins
Required of all graduate students prior to writing a thesis or dissertation. (Spring—day)
- 225 Microbial Physiology I (3)** Affronti, Reich
Biochemical features of various microorganisms—especially bacteria—described and compared with those of the animal cell. Prerequisite: Bioc 221–22, Micr 201; or permission of instructor. (Fall—day)
- 226 Microbial Physiology II (3)** Affronti, Reich
Interactions of drugs and microorganisms—action of drugs on microbes, resistance of microbes to drugs, metabolism of drugs by microbes. Prerequisite: Micr 225 or permission of instructor. (Spring—day)
- 230 Immunology (4)** Wright
Fundamental immunologic concepts. Serologic and immunologic procedures as applied to clinical and research situations emphasized in the laboratory. Prerequisite: Micr 201 or equivalent. Laboratory fee, \$16.
- 231 Cellular Immunology (2)** Staff
Study of immunological functions of reticulo-endothelial tissues, theories of autoimmunity, graft rejection, tumor immunity, delayed hypersensitivities, and heritable immunogenic defects. (Fall—day)
- 233 Molecular Biology of Viruses (4)** Robbins, Huang
Biochemical and genetic characterization of viruses. Prerequisite: Micr 201 or equivalent. Laboratory fee, \$16. (Fall—day)
- 235 Systematic Bacteriology (2)** Hugh
History of bacterial classification, international rules of nomenclature as applied to bacteria, development of bacterial classification based on relationships, survey of characteristics of bacterial groups. Prerequisite: Micr 201 or equivalent. (1970–71 and alternate years: fall—day)
- 251 Bacteriology (2)** Hugh
Clinical situations involving bacteriology. Prerequisite: Micr 201 or equivalent. (Fall—day)
- 255 Virology (2)** Huang, Robbins
General principles of virology; emphasis on clinical situations. Prerequisite: Micr 201 or equivalent. (Fall—day)
- 257 Immunochemistry (3)** Wright
Biochemical, physiochemical, and genetic aspects of immunologically active substances. Prerequisite: Bioc 221–22 or equivalent. Micr 201 and 230 recommended. Limited enrollment. (1971–72 and alternate years: spring—day)
- 258 Microbial Genetics (2)** De Giovanni-Donnelly, Legator
Survey of microbial systems that depict basic concepts of genetic principles. Prerequisite: Micr 201 or equivalent. (Spring—day)
- 277–78 Seminar: Microbiology (1–1)** Staff
Required of graduate students. (Academic year—day)

- 293 Special Topics in Microbiology (arr.)** Staff
Selected topics in microbiology. May be repeated for credit. (Fall and spring—day)
- 295 Research in Microbiology (arr.)** Staff
Content differs each time the course is offered; may be repeated for credit. (Fall and spring)
- 299–300 Thesis Research (3–3)** Staff
(Academic year)
- 398 Advanced Reading and Research (arr.)** Staff
Limited to students preparing for the Doctor of Philosophy general examination. May be repeated for credit. (Fall and spring)
- 399 Dissertation Research (arr.)** Staff
Limited to Doctor of Philosophy candidates. May be repeated for credit. (Fall and spring)

Music

Associate Professors George Steiner (*Chairman*), Robert Parris
Assistant Professor N.A. Tilkens
Assistant Professorial Lecturers N.O. Scribner, Jr. (*Organ*), W.B. Dobry, Margaret Tolson (*Piano*), J.E. Stephens (*Trumpet*), Nancy Mandel
Studio Lecturers in Applied Music Jule Zabawa (*Voice*), Marian McNabb (*Piano and Organ*), Constance Russell (*Piano*), R.O. White (*Oboe*), Phyllis Gieseler (*Voice*), S.E. Ramsay (*French Horn*), N.M. Irvine (*Bass*), Ruth Wright (*Flute*), Diana Molinari (*Piano*), T.H. Wardlow (*Percussion Instruments*), E.C. Johns (*Guitar*), R.A. Norris (*Guitar*), Faith Carman (*Harp*), Helen Coffman (*Cello*), R.H. Kraft (*Trombone*), W.H. Mann (*Flute*), J.E. Marlow (*Guitar*), Richard Parnas (*Violin and Viola*), Shirley Renshaw (*Piano*), Patricia Cochran (*Violin*), W.R. Huntington (*Clarinet, Recorder, and Saxophone*), Walter Maciejewicz (*Bassoon*), Malinee de Silva (*Piano*), R.C. Raffaele (*Guitar*), Gretchen Scharf (*Guitar*)
Director of Choral Groups S.H. Prussing

Bachelor of Arts with a major in (1) Music History and Literature, (2) Music Theory, or (3) Applied Music (Departmental).—Prerequisite: the Arts and Letters curriculum, page 78, or equivalent, including Mus 5–6.

Required: in addition to the general requirements, pages 83–87, Mus 103–4 and 131–32; a minimum of 4 semesters in Music Ensemble groups (or evidence of equivalent experience); 24 semester hours of second-group courses as follows:

1. For the major in *Music History and Literature*.—Twelve semester hours of Music History and Literature courses, 6 hours of Applied Music, and 6 hours of Music Theory courses.
2. For the major in *Music Theory*.—Twelve semester hours of Music Theory courses, 6 hours of Music History and Literature courses, and 6 hours of piano (other instrument or voice if departmental requirements for proficiency in piano are met).
3. For the major in *Applied Music*.—Twelve semester hours of Applied Music in field of specialization, senior recital, 6 hours of Music Theory courses, and 6 hours of Music History and Literature courses.

Master of Arts in the field of Musicology.—Prerequisite: a Bachelor's degree with a major in music, or equivalent.

Required: the general requirements, pages 91-97; 18 semester hours of Music History and Literature or Music Theory courses; 6 semester hours of Applied Music; and a thesis demonstrating research ability in musicology.

Master of Music in the field of Music Theory, Music Composition, Conducting, or Applied Music.—Prerequisite: a Bachelor's degree with an undergraduate major in one of the following, at this University, or equivalent: (1) Music History and Literature, (2) Music Theory, or (3) Applied Music.

Required: the general requirements, pages 91-97. The 30 semester hours of required second- and third-group course work including a thesis (299-300) are as follows:

1. *In the field of Music Theory.*—Eighteen semester hours of Music History and Literature and Music Theory courses, 6 hours of Applied Music, and a thesis demonstrating research ability in theoretical, creative, or analytical techniques.

2. *In the field of Music Composition.*—Eighteen semester hours of Music History and Literature and Music Theory courses, 6 hours of Applied Music, and a creative thesis of one composition in large form properly prepared for performance (chamber music, a symphonic form, or a choral work with orchestral accompaniment) including a written theoretical, formal, and harmonic analysis of the work.

3. *In the field of Conducting.*—Eighteen semester hours of Music History and Literature and Music Theory courses, 6 hours of Applied Music, and a thesis demonstrating research ability in theoretical, creative, or analytical techniques. The requirements also include an acceptable public conducting performance.

4. *In the field of Applied Music.*—Twelve semester hours of Applied Music in the area of concentration (piano, harpsichord, organ, voice, string or orchestral woodwind instrument), 12 hours of Music Theory and Music History and Literature courses. The thesis area consists of (1) a public recital or performance before a designated committee—such a recital or performance must be representative of an extensive and well-rounded repertory, performed on a professionally accepted artistic level, including verbal historical and analytical lecture notes on the musical content of the program; (2) demonstrated leadership in an ensemble performance (opera or oratorio for voice); and (3) a written report on some approved theoretical area related to the student's concentration.

Bachelor of Arts in Education with a teaching field in Music.—Prerequisite: the Education curriculum, page 80.

Required: the Music option and professional courses listed on pages 112, 115-16.

MUSIC HISTORY AND LITERATURE

FIRST GROUP

3 Introduction to Musical Understanding (3)

Introductory history of musical styles, related to listening; elements and materials of music. (Fall and spring—day) Steiner, Tilkens

4 Survey of Music Literature (3)

Introductory study of musical forms, structures, and textures; aural analysis of selected literature. (Spring—day) Steiner

SECOND GROUP

103-4 History of Music (3-3)

Development of music in the Western World from the early Christian Era to the present. (Academic year—day) Tilkens

- 105 Music of the Baroque Period (3)** Tilkens
Study of the musical styles, techniques, and literature from 1600 to 1750.
(Spring—day)
- 106 Music of the Classic Period (3)** Tilkens
Study of styles, techniques, and literature from the 18th century schools
through Haydn, Mozart, and Beethoven. (Fall—day)
- 107 Music of the Romantic Period (3)** Mandel
Study of the musical styles, backgrounds, and literature from Schubert
through the 19th century. (Fall—day)
- 108 Music of the 20th Century (3)** Steiner
The principal schools, techniques, developments, and trends of the 20th
century. (Spring—day)
- 109 Orchestra Literature (3)** Steiner
Survey of the history and styles of orchestra literature, analysis of repre-
sentative works.
- 110 Chamber Music Literature (3)** Steiner
Survey of the history and styles of chamber music literature, analysis of
representative works.
- 121 The Opera (3)** Mandel
Survey of the history and styles of opera, analysis of representative works.
(Spring—day)
- 125 Keyboard Music Literature (3)** Tilkens
Survey of the history, style, and major content of the keyboard literature
from the 16th century to the present.
- 173 Piano Pedagogy (3)** Tolson
Principles, materials, and methods for teaching the piano. (Spring—
day)

THIRD GROUP

- 203 Bibliography and Research Methodology (3)** Mandel
(Spring—day)
- 209 History of Musical Instruments (3)** Steiner
- 234 Seminar: Performance Practices in Selected Areas (3)** Staff
- 238 Seminar: Analytical Studies in Music History (3)**

MUSIC THEORY

FIRST GROUP

- 1 Elements of Music Theory (3)** Parris
Notation, scales, keys, intervals, terms, rhythms, ear-training, sight-singing,
elementary keyboard harmony, melodic and harmonic dictation. (Fall
and spring—day)

5-6 Elementary Harmony (3-3)

Triads, inversions; chord analysis, construction, and progression; part-writing, modulations, figured bass. Prerequisite: Mus 1 or satisfactory passing of placement examination. (Academic year—day) Parris

SECOND GROUP**131-32 Advanced Harmony (3-3)**

Practice in harmonic writing and analysis, realization of unfigured bass, altered chords, elementary 18th century counterpoint. Prerequisite: Mus 5-6 or equivalent. (Academic year—day) Parris

135 Counterpoint (3)

Study and practice of early contrapuntal techniques. (Fall—day) Parris

137 Orchestration (3)

Instrumental scoring. Parris

138 Form and Analysis (3)

Analysis of musical forms in representative musical literature. —day) Parris (Spring)

151 Conducting (3)

Technique of conducting, score reading, rehearsal procedures, analysis, and interpretation of selected musical literature; practice in conducting. (Fall—day) Steiner

THIRD GROUP**231-32 Composition (3-3)**

(Academic year) Parris

235 Advanced Counterpoint (3)

(Fall—day) Parris

251 Advanced Conducting (3)

(Fall—day) Steiner

299-300 Thesis Research (3-3)

(Academic year) Staff

APPLIED MUSIC

All Applied Music courses may be repeated for credit. The supplementary fee is waived for full-time music majors. With the exception of Mus 51, 52, 53, and 54, one-semester hour courses are individual lessons of ½ hour a week—supplementary fee, \$40; 2-, 3-, or 6-semester hour courses are individual lessons of 1 hour a week—supplementary fee, \$80. Six-semester hour courses include lessons, supervised ensemble preparation, and required practice 15 hours a week. Mus 51, 52, 53, and 54 do not include individual lessons and carry no supplementary fee.

FIRST GROUP

Three hours of practice are required for each semester hour.

11 Piano (1)

(Fall and spring)

Tolson, McNabb, Russell

- | | |
|---|-------------------------|
| 12 Piano (2)
(Fall and spring) | Tolson, McNabb, Russell |
| 13 Voice (1)
(Fall and spring) | Zabawa, Gieseler |
| 14 Voice (2)
(Fall and spring) | Zabawa, Gieseler |
| 15 Organ (1)
(Fall and spring) | Scribner, McNabb |
| 16 Organ (2)
(Fall and spring) | Scribner, McNabb |
| 17 Violin (1)
(Fall and spring) | Cochran, Parnas |
| 18 Violin (2)
(Fall and spring) | Cochran, Parnas |
| 19 Classical Guitar (1)
(Fall and spring) | Johns, Norris |
| 20 Classical Guitar (2)
(Fall and spring) | Johns, Norris |
| 21 Viola (1)
(Fall and spring) | Parnas |
| 22 Viola (2)
(Fall and spring) | Parnas |
| 23 Cello (1)
(Fall and spring) | Coffman |
| 24 Cello (2)
(Fall and spring) | Coffman |
| 25 Bass (1)
(Fall and spring) | Irvine |
| 26 Bass (2)
(Fall and spring) | Irvine |
| 27 Flute (1)
(Fall and spring) | Wright |
| 28 Flute (2)
(Fall and spring) | Wright |
| 29 Recorder (1)
(Fall and spring) | Huntington |
| 30 Recorder (2)
(Fall and spring) | Huntington |

- 31 **Oboe** (1)
(Fall and spring) White
- 32 **Oboe** (2)
(Fall and spring) White
- 33 **Clarinet** (1)
(Fall and spring) Huntington
- 34 **Clarinet** (2)
(Fall and spring) Huntington
- 35 **Saxophone** (1)
(Fall and spring) Huntington
- 36 **Saxophone** (2)
(Fall and spring) Huntington
- 37 **Bassoon** (1)
(Fall and spring) Maciejewicz
- 38 **Bassoon** (2)
(Fall and spring) Maciejewicz
- 39 **French Horn** (1)
(Fall and spring) Ramsay
- 40 **French Horn** (2)
(Fall and spring) Ramsay
- 41 **Trumpet** (1)
(Fall and spring) Stephens
- 42 **Trumpet** (2)
(Fall and spring) Stephens
- 43 **Trombone** (1)
(Fall and spring) Kraft
- 44 **Trombone** (2)
(Fall and spring) Kraft
- 45 **Percussion** (1)
(Fall and spring) Wardlow
- 46 **Percussion** (2)
(Fall and spring) Wardlow
- 47 **Harp** (1)
(Fall and spring) Carman
- 48 **Harp** (2)
(Fall and spring) Carman
- 51 **Orchestra** (1)
Preparation and performance of orchestral literature. Prerequisite: audition before Director. (Fall and spring—evening) Steiner

- 52 Instrumental Ensemble (2)** Steiner
Chamber ensemble groups in addition to orchestra participation. (Fall and spring)
- 53 Chorus (1)** Prussing
Preparation and performance of choral literature. Prerequisite: audition before Director. (Fall and spring—day)
- 54 Chamber Choir (2)** Prussing
Small vocal groups in addition to chorus participation. (Fall and spring—day)

SECOND GROUP

Prerequisite: audition to meet departmental requirements. Required practice: 5 hours a week for 1-semester hour courses, 10 hours a week for 2-semester hour courses, 12 hours a week for 3-semester hour courses.

- 111 Piano (1)** Tolson, Russell
(Fall and spring)
- *112 Piano (2 or 3)** Tolson, Russell
(Fall and spring)
- 113 Voice (1)** Zabawa, Gieseler
(Fall and spring)
- *114 Voice (2 or 3)** Zabawa, Gieseler
(Fall and spring)
- 115 Organ (1)** Scribner
(Fall and spring)
- *116 Organ (2 or 3)** Scribner
(Fall and spring)
- 117 Orchestral Instrument (1)** Staff
(Fall and spring)
- *118 Orchestral Instrument (2 or 3)** Staff
(Fall and spring)
- 119 Classical Guitar (1)** Staff
(Fall and spring)
- *120 Classical Guitar (2 or 3)** Staff
(Fall and spring)

THIRD GROUP

- 211 Piano (3)**
(Fall and spring)
- 212 Piano (6)**
(Fall and spring)

* Only Music majors may elect 3 semester hours of credit.

213 Voice (3)

(Fall and spring)

214 Voice (6)

(Fall and spring)

215 Organ (3)

(Fall and spring)

216 Organ (6)

(Fall and spring)

217 Orchestral Instrument (3)

(Fall and spring)

218 Orchestral Instrument (6)

(Fall and spring)

Pathology

Professors T.M. Peery (*Chairman*), W.R. Duryee (*Research—Experimental*), F.N. Miller, Jr., William Newman, J.C. Smith

Clinical Professors L.E. Zimmerman (*Ophthalmic*), J.M. Blumberg, E.B. Helwig (*Dermatologic*), G.H. Reifenshtein, N.S. Irely, Robert Sauer (*Comparative*), Cornelia Hoch-Ligeti

Professional Lecturers Mary Matthews, P.D. Olch (*History of Medicine*)
Associate Professors W.L. Marsh, Lois Platt (*Cytology*), Alexander Breslow, F.S. Jannotta

Associate Clinical Professors J.S. Howe, V.E. Martens, Theodore Winship, R.E. Palmer, W.J. Jaffurs

Assistant Professors S.G. Kent, Suzanne Hammersberg (*Medical Technology*), B.C. Zook (*Comparative*)

Assistant Clinical Professors W.F. Enos, L.W. Fix, Grace Guin, E.H. Zeitler, Marjorie Williams, C.B. Cook, D.R. Parkinson, I.D. Godwin, M.A. Weinberger, Floris Garner (*Comparative*), Gloria Brennan

Special Lecturer L.C. Johnson

Bachelor of Science in Medical Technology.—Prerequisite: the Medical Technology curriculum, pages 79–80.

Required: the general requirements, pages 83–87, including B Sc 112 and additional second-group Biological Sciences courses as recommended, see pages 87–88; and Path 115–16, 117–18, 119–20, offered in the University Hospital.

Master of Science in the field of Pathology.—Prerequisite: a Doctor of Veterinary Medicine degree from a school recognized by the American Veterinary Medical Association.

Required: the general requirements, pages 91–97. The program of study consists of 31 semester hours of course work distributed as follows: (1) Path 201 (8 semester hours), 2 semester hours selected from any basic medical science courses. Path 283 (four months full-time in hospital-based clerkship for which the student receives 15 semester hours of credit); and (2) a thesis (6 semester hours) based on a two-year training period in Veterinary Pathology. This training period may be

taken at either the Armed Forces Institute of Pathology or the Office of Pathology, National Zoological Park, Smithsonian Institution.

Doctor of Philosophy fields of study in Pathology: Comparative Pathology and Ophthalmic Pathology.—See pages 91–95, 97–99, for requirements for the degree.

115–16 Introduction to Medical Science Marsh, Hammersberg, and Staff
(1–1)

Lectures for medical technology students on physiology, pathology, and medicine to accompany Path 119–20. (Academic year—1 hour a week)

117–18 Principles in Medical Technology Marsh, Hammersberg, and Staff
(4–4)

For medical technology students. Theories, principles, sources of error of methods used in clinical chemistry, clinical bacteriology, serology, hematology, clinical microscopy. (Academic year—4 hours a week)

119–20 Medical Technology Laboratory Marsh, Hammersberg, and Staff
(10–10)

Rotation through University Hospital pathology laboratories: hematology and urinalysis, 12 weeks; chemistry, 12 weeks; bacteriology and parasitology, 12 weeks; blood bank, 6 weeks; serology, 4 weeks; tissue pathology, 4 weeks. (35 hours a week for 50 weeks)

***201 Pathology (8)** Staff

Inflammations, degenerations, malformations, trauma, neoplasms. Pathology of organ systems; correlation with symptoms and physical signs. Gross and microscopic study of diseased tissues. Case studies. (Fall—12 hours a week)

***262 Problems in Experimental Cellular Pathology (1)** Duryee

Cytological and biochemical aspects of cellular function in relation to normal and selected pathological conditions. (Spring—1 hour a week)

***266 Comparative Pathology I (1)** Sauer, Zook

Participation in an autopsy service involving wild animals in captivity, comparison of diseases in various animal species with those in man. Limited to 4 students. Path Lab., Nat'l Zoological Park. (Fall—four 3-hour sessions)

***271 Tissue Reactions to Drugs (1)** Irely

Study of the problems involved in recognizing instances of untoward reaction to therapy. Case presentations. (Spring—1 hour a week)

***276 Seminars in Pathology (2)** Peery and Staff

Conferences on current topics in pathology, conducted by and primarily for residents in pathology. Each student teams up with a resident to prepare and present a seminar on a selected topic. Univ. Hosp. (Spring—2 hours a week)

***283 Anatomical Pathology Clerkship (5 to 30)** Staff

Necropsy and surgical pathology service. Prerequisite: Path 201. Five semester hours of credit for each 4-week period. Students may receive

* Open to limited number of graduate students, with permission.

up to 30 semester hours of credit for 6 months full time. (Fall or spring)

295 Comparative Pathology II (5 to 30)

Garner and Staff

Participation in veterinary pathology service, including wild and domestic animals. Prerequisite: Path 201. Five semester hours of credit for each 4-week period. Students may receive up to 30 semester hours of credit for 6 months full-time. Armed Forces Inst. of Path. (Fall or spring)

299-300 Thesis Research (3-3)

Staff

(Academic year)

398 Advanced Reading and Research (arr.)

Staff

Limited to students preparing for the Doctor of Philosophy general examination. May be repeated for credit. (Fall and spring)

399 Dissertation Research (arr.)

Staff

Limited to Doctor of Philosophy candidates. May be repeated for credit. (Fall and spring)

Pharmacology

Professor H.G. Mandel (Chairman)

Professorial Lecturers B.B. Brodie, F.E. Hahn

Associate Professors V.H. Cohn, Jr., Paul Mazel, K.S. Kim (Research), S.E. Fabro (Research), W.R. Jondorf (Research), J.A. Straw

Assistant Professors G.A. Hahn (Research), Philip Klubes (Research), Barbara Roth-Schechter

Instructors Glenna Fitzgerald, Sau-Wah Kwan

Special Lecturer D.J. Boullin

Master of Science in the field of Pharmacology.—Prerequisite: a Bachelor of Arts or Bachelor of Science degree. The undergraduate program must have included the following courses, or equivalent: B Sc 11-12; Phys 1, 2; Chem 11-12, 22, 51-52, 53-54. One year of calculus and a course in physical chemistry are normally recommended but may be taken during the work towards the Master's degree.

Required: the general requirements, pages 91-97, including Bioc 221-22; Phyl 201; Phar 201, 299-300. The remaining courses may be selected from Bioc 224, 241, 266; Chem 156; Micr 201, 225, 226, 233; Phar 267, 269, 272, 279, 281, 282, 283.

Doctor of Philosophy fields of study in Pharmacology: Chemotherapy and Molecular Pharmacology, Developmental Pharmacology, Physiological Disposition of Drugs, and Biochemical Pharmacology.—See pages 91-95, 97-99, for requirements for the degree.

201 Pharmacology (8)

Mandel and Staff

Lectures, laboratory, conferences on interaction of drugs and biological systems as a basis for rational therapy of disease. Prerequisite: biochemistry and physiology, or approval of Department. (Fall—day)

Staff

203 Fundamental Principles of Pharmacology (2)

Basic principles of pharmacology, including drug receptor interactions, structure activity relationships, pharmacokinetics, membrane phenomena, cellular control mechanisms, drug toxicity. (Fall—day)

215 Adolescent Drug Abuse: a Program for Educators (3) Cohn and Staff

For secondary school teachers, counselors, and administrators. Multi-disciplinary lectures and discussions concerning the physiological and psychological effects of narcotics, central nervous system stimulants and depressants, alcohol, and hallucinogenic and psychedelic drugs; psychosocial factors leading to adolescent drug abuse; legal implications of drug abuse; prevention, control, and treatment of drug abuse. (Fall and spring—day)

252 Seminar: Clinical Pharmacology (2)

Problems in therapeutics; emphasis on drugs used in treatment of cardiovascular and infectious diseases. Participation in discussions and preparation of lectures. Enrollment limited. (1971-72 and alternate years: spring—day)

254 Frontiers in Pharmacology (1) Mandel and Staff

Recent advances and fields of research in pharmacology. Most of the material presented by laboratory scientists from neighboring institutions. (Spring—day)

256 Molecular Pharmacology (2) F. Hahn

Current theory on action of drugs, especially chemotherapeutic agents, at molecular level. Effect of drugs on biosynthetic processes of the cell with respect to DNA, messenger RNA, transfer RNA, ribosomes, protein, cell wall, and intermediary metabolites. Factors which alter action of drugs, such as drug interactions and resistance. (Spring—day)

258 Cancer Chemotherapy (1) Mandel and Staff

Mechanisms by which drugs inhibit the growth of tumor cells. (1971-72 and alternate years: spring—day)

259 Developmental Pharmacology (1) Fabro

Lectures, seminars, conferences. Teratogenic actions of drugs; pharmacological principles which apply during prenatal and perinatal development. (1971-72 and alternate years: spring—day)

260 Endocrine Pharmacology (1) Kim

Lectures and seminars on recent advances in the pharmacology and mechanism of action of various hormones. (1971-72 and alternate years: spring—day)

267 Pharmacological Research (arr.) Staff

Content differs each time the course is offered; may be repeated once for credit toward a Master of Science degree. (Fall and spring—day)

269 Pharmacology Seminar (1) Staff

Recent advances in pharmacology. Content differs each time the course is offered; may be repeated once for credit toward a Master of Science degree. (Fall and spring—day)

272 Physiological Disposition of Drugs (3) Cohn

Fate of drugs in biological tissue. Absorption, distribution, chemical alteration, excretion of drugs; physical, chemical, and biological factors affecting these processes. Limited to 20 students. Prerequisite: Phar 201. (1971-72 and alternate years: spring—day)

- 275-76 Advanced Topics in Pharmacology I-II (1-1)** Staff
Lectures and seminars on advances in mechanisms of drug action; pharmacology of new drugs; theoretical aspects of pharmacology; laboratory techniques. (1971-72 and alternate years: academic year—day)
- 277-78 Advanced Topics in Pharmacology III-IV (1-1)** Staff
Continuation of Phar 275-76. (1970-71 and alternate years: academic year—day)
- 279 Special Topics in Pharmacology (arr.)** Staff
Selected aspects of drug action. Content differs each time the course is offered; may be repeated once for credit toward a Master of Science degree. (Fall and spring—day)
- 281 Physiological Techniques in Pharmacology—Lecture (2)** Mazel, Straw
Physiological techniques for obtaining information on mechanism and site of action of pharmacological agents. Limited to 20 students. Phar 281 may be taken without 282. Prerequisite: Phar 201. (1971-72 and alternate years: spring—day)
- 282 Physiological Techniques in Pharmacology—Laboratory (2)** Mazel, Straw
Accompanies Phar 281. Prerequisite: Phar 201. Prerequisite or concurrent registration: Phar 281. (1971-72 and alternate years)
- 283 Biochemical Techniques in Pharmacology (arr.)** Cohn
Lectures and laboratory. Theory and practice of modern biochemical techniques applicable to study of metabolic fate and mechanism of action of drugs. Prerequisite: Phar 201. (1971-72 and alternate years)
- 295 Reading and Research (arr.)** Staff
Independent study for students preparing for the Master of Science degree. May be repeated for credit. (Fall and spring)
- 299-300 Thesis Research (3-3)** Staff
(Academic year)
- 398 Advanced Reading and Research (arr.)** Staff
Limited to students preparing for the Doctor of Philosophy general examination. May be repeated for credit. (Fall and spring)
- 399 Dissertation Research (arr.)** Staff
Limited to Doctor of Philosophy candidates. May be repeated for credit. (Fall and spring)

Philosophy

Professors Thelma Z. Lavine, R.H. Schlagel (*Chairman*)
Associate Professors C.H. Pfuntner, W.B. Griffith
Associate Professorial Lecturer Laura Schrenk
Assistant Professor Gerald Donaldson

Bachelor of Arts with a major in Philosophy (Field-of-Study).—Prerequisite: the Arts and Letters curriculum, page 78.

Required: in addition to the general requirements, page 83–87, the passing of the Philosophy major examination at the end of the senior year. The coordinated knowledge upon which the student will be examined is the following: (1) history of philosophy and (2) problems of philosophy. A proseminar (Phil 199–200) assists the student in preparing for the major examination.

Master of Arts in the field of Philosophy.—Prerequisite: an undergraduate major in Philosophy at this University or equivalent, as attested by passing this University's major examination in Philosophy; the following courses or equivalent: Phil 111, 112, 113, 121, 131, and 152.

Required: the general requirements, pages 91–97. As much as possible of the required course work must be in third-group courses. If second-group courses are elected, students are required to do more intensive and extensive work than undergraduates. A general written examination in two areas of Philosophy and an oral examination in the student's special field are required in addition to a Master's thesis of substantial length.

FIRST GROUP

61–62 Introduction to Philosophy (3–3)

Staff

(Phil 61 replaces former 52; Phil 62 replaces former 51)

Problems of modern philosophy in relation to scientific and social developments since the Renaissance. Phil 61: theories of reality. Phil 62: theories of knowledge. Phil 61 or 62 may be taken independently.

(Academic year—day and evening)

71 Philosophy and Literature (3)

Lavine

Philosophical foundations of psychoanalytical psychiatry, existentialism, and Marxism and their expression in literature, e.g., in the works of Mann, Kafka, Camus, Sartre, Malraux, Silone, and Koestler.

SECOND GROUP

111 History of Ancient Philosophy (3)

Donaldson

History of Western philosophy from early Greece to the early Middle Ages. (Fall—day)

112 History of Modern Philosophy (3)

Pfuntner

History of Western philosophy of the 17th and 18th centuries (Descartes to Kant). (Spring—evening)

113 19th Century Philosophy (3)

Lavine

European philosophy from Kant to Nietzsche. (Fall—evening)

121 Introduction to Logic (3)

Griffith

Systematic study of the principles of valid inference with attention to the development of skill in logical analysis and evaluation of arguments, and to the elementary theory of formal systems. (Fall—day)

*127 Theories of History (3)

Lavine

(Formerly Phil 180)

Critiques of philosophies of history: idea of progress, historicism, Hegelian-Marxian dialectic, cyclical, and social-scientific views. Contemporary problems of historical knowledge.

* An interdepartmental course offered by the departments of Philosophy and History.

- 131 **Ethics (3)** Griffith
Theories of "the good" and "the right" from Plato to Sartre. (Fall—day)
- 132 **Social Philosophy (3)** Lavine
Social philosophies from Luther to Marxism and Fascism. (Spring—day)
- 142 **Philosophy of Law (3)** Donaldson
Systematic examination of the fundamental concepts of law and jurisprudence; special emphasis on their treatment by contemporary philosophers and jurists. (Spring—day)
- 151 **Myth, Science, and the Modern Mind (3)** Schlagel
A course in the philosophy of science. Comparison of the mythical and scientific outlook; emphasis on the development and nature of scientific concepts, methodology, and explanation from Copernicus to Einstein. (Fall—day)
- 152 **Knowledge, Truth, and Reality (3)** Schlagel
Inquiry into the basis and structure of knowledge, the problem of perception and independent reality, and the meaning and criteria of truth. (Spring—day)
- 162 **Aesthetics (3)** Pfuntner
Nature of aesthetic experience, problems of appreciation and criticism in the arts, and theories of artistic creation. Emphasis on contemporary arts and criticism. (Spring—evening)
- 172 **American Philosophy (3)** Pfuntner
Philosophies of Peirce, Royce, James, Dewey, and Santayana as representatives of American thought. (Fall—evening)
- 192 **Contemporary Philosophy: Analytical (3)** Schlagel
The two dominant movements of recent Anglo-American philosophy, logical positivism and British ordinary language philosophy, as represented by G.E. Moore, Wittgenstein, Ryle, Austin, Ayer, etc. (Fall—day)
- 193 **Contemporary Philosophy: Phenomenological (3)** Griffith
The phenomenological movement, including its development into German and French existentialism, and its more recent phases.
- 199–200 **Proseminar: Readings in Philosophy (3–3)** Staff
Conferences and group discussions in preparation for field-of-study major examination.

THIRD GROUP

- 201–2 **Readings and Research (3–3)** Staff
Advanced readings and reports. Investigation of special problems. (Academic year)
- 210 **Seminar: Ancient Philosophy (3)** Donaldson
Content differs each time course is offered; may be repeated for credit. Topic for 1970–71: a study of the major works of Aristotle. (Fall—evening)

- 216 Seminar: Kant (3) Lavine
Critique of Pure Reason.
- 221 Seminar: Logical Theory (3) Griffith
Metatheory of deductive systems, modal logics; historical and philosophical import of recent developments. (Fall—evening)
- 231 Seminar: Ethical Theory (3) Griffith
Readings in recent ethical philosophy. (1971-72 and alternate years: fall—evening)
- 251 Seminar: Philosophy of Science (3) Schlagel
Intensive study of selected problems in the historical and theoretical foundations of science. (Spring—evening)
- 252 Seminar: Epistemology (3) Schlagel
Study of selected problems.
- 262 Seminar: Aesthetics (3) Pfuntner
Study of selected problems. (1971-72 and alternate years: spring—evening)
- 272 Seminar: American Philosophy (3) Pfuntner
Important American contributions to theories of the self, society, and history. (Spring—evening)
- 280 Seminar: Philosophy of History (3) Lavine
Current issues concerning the problem of historical knowledge.
- 299-300 Thesis Research (3-3) Staff
(Academic year)

Physical Education

Professors Elizabeth Burtner, R.G. Hanken, V.J. DeAngelis, Loretta Stallings, J.L. Breen (Chairman)
 Professorial Lecturers W.D. Thompson, Donald Hawkins
 Associate Professors Lyndale George, Jeanne Snodgrass, Maida Withers
 Associate Professorial Lecturer Evelyn DeBoeck
 Assistant Professors Gayle Clapp, Honey Nashman, Nancy Johnson, B.P. Berube, Mabel McEwan, Martha Bair, Judith Young
 Assistant Professorial Lecturers Martha Jesnak, W.R. Scott
 Instructor K.E. Bumgarner
 Lecturer Calva Collier

Programs of study in Physical Education leading to the degrees of *Bachelor of Science in Physical Education* (opportunity for specialization in dance, elementary school physical education, or special physical education), *Bachelor of Arts in Education* (teaching field in Dance), and *Master of Arts in Education* (field in Dance or field in Physical Education with opportunity for specialization in dance, elementary school physical education, safety education, or special physical education) are offered by the School of Education (see pages 101-25).

This Department includes all the recognized athletic activities of University students except intercollegiate athletics for men.

Four semesters of Physical Education (PE 4, 5, or 6) are required for graduation, except for those students exempt under the regulations stated on pages 76-77.

A medical examination is required before participation in physical education activities.

The University is not responsible for injuries received in intramural games or in any of the activities of the Department of Physical Education, and the student assumes full responsibility therefor.

Courses with titles followed by the parenthetical designation (men) are available to men students only; those with titles followed by the parenthetical designation (women) are available to women students only.

FIRST GROUP

*4 Physical Education Activities (1) Staff

Two periods a week of instruction in coeducational physical education activities chosen from those offered each semester. May be repeated for credit not to exceed 4 semester hours. (Fall and spring—day)

*5 Physical Education Activities (1) (men) Staff

Two periods a week of instruction in physical education activities chosen from those offered each semester. May be repeated for credit not to exceed 4 semester hours. (Fall and spring—day)

*†6 Physical Education Activities (1) (women) Staff

Instruction in physical education activities (3 periods a week for first-year students; two periods a week for second-year students) chosen from those offered each semester. May be repeated for credit not to exceed 4 semester hours. (Fall and spring—day)

20 Current Health Topics (1) Young

Lecture and discussion pertinent to the health of today's college student. Guest medical lecturers. (Spring—evening)

39-40 Seminar: Physical Education (1-1) Staff

(Academic year)

41 First Aid (1) Staff

First-aid training includes Red Cross certification (standard). (Spring—day)

*43-44 Techniques of Physical Education Bair, DeAngelis

Activities (1 to 3-1 to 3)

Development of individual physical and motor abilities; techniques of sports and dance activities. Conference to be arranged. (Academic year—day)

* A Physical Education fee of \$4.50 a semester is required for registration in one or more of the activity courses.

† Students whose medical examinations indicate the desirability for remedial or restricted activity are assigned to programs especially adapted to their needs.

49 **Human Anatomy** (3) Staff
Systematic study of the structure of the human body. Emphasis on neuro-muscular mechanisms, cardiovascular system, and neuroanatomy, including conduction pathways. (Fall—day)

50 **Kinesiology** (3) Berube
Analysis of human movement including mechanical physics, anatomy, and physiology. Prerequisite: approved course in anatomy. (Spring—day)

51-52 **Teaching Physical Education Activities** (3-3) Staff
Methods of guiding individual development of physical fitness, motor performance, posture and body mechanics; techniques of teaching individual, dual, and team sports, and dance activities. (Academic year—day)

57 **Dance Technique I** (1) Staff
Intermediate technique in modern dance.

58 **Dance Technique II** (1) Staff
Advanced technique in modern dance.

SECOND GROUP

101 **Physical Education in the Elementary School** (3) Snodgrass
For Elementary Education and Physical Education majors. Implications of child growth and development for school and playground programs: philosophy, curriculum, techniques of teaching, facilities and equipment, evaluation. (Fall—evening)

102 **Physical Education Curriculum in the Elementary School** (3) Staff
Curriculum for kindergarten and grades 1-6 in physical education activities. Prerequisite: PE 101. (Spring—evening)

103 **Philosophy and Principles of Physical Education** (3) Breen
(Formerly *History and Principles of Physical Education*)
History as it relates to contemporary physical education; aims, objectives, and philosophy. (Spring—day)

105 **Special Physical Education** (3) Nashman
Corrective, developmental, and adapted physical education for the handicapped—orthopaedic, neurological, cardiovascular, and mentally retarded. Clinical experience. (Spring—evening)

107 **Teaching Ethnic Dance** (1 or 2) Burtner
(Formerly *Teaching Recreational Dance*)
Methods and materials for teaching the folk and social forms of dance. (Fall—day)

109 **Dance Composition I** (1 or 2) Withers
Basic elements and principles of composition. (Fall—day)

110 **Dance Composition II** (1) Withers
Advanced problems in composition. May be repeated once for credit. (Spring—day)

- 111-12 **Sports Education Technique I-II** (2 or 3-2 or 3) Staff
(Formerly Teaching Physical Education Activities)
 Techniques of teaching individual, dual, and team sports, and dance activities as needed; methods of coaching and officiating. (Academic year—day)
- 113-14 **Practice in Teaching Physical Education Activities** (3-3) Bair, Hanken
 Application of principles and techniques in teaching selected sport and dance activities. Supervised experience in instructional and extracurricular programs. (Academic year—day)
- 115-16 **Intramural Program Organization** (2 or 3-2 or 3) Bumgarner
 Principles of administration, organization, and supervision in junior high school, senior high school, and college intramural programs. (Academic year—day)
- 117 **Teaching Modern Dance** (2 or 3) Burtner
 Methods of teaching modern dance: technique, improvisation, and composition. Analysis of accompaniment. Secondary, college, adult levels. (1970-71 and alternate years: fall—evening)
- 118 **Dance Production** (2 or 3) Burtner
 Planning, choreographing, and staging of dance: demonstrations, concerts, musicals, plays, festivals, lighting, costuming, sets, make-up, accompaniment. (1970-71 and alternate years: spring—evening)
- 119 **Creative Dance for Children** (3) Withers
 Exploration and understanding of creative movement for children. Evaluation of methods and materials. Dance for children with special education problems. (Fall—day)
- 120 **Repertory** (1) Withers
 Study and performance of dance works. Admission by permission of instructor. May be repeated once for credit. (Fall and spring)
- 122 **Methods and Materials for Health Education** (3) Stallings
 Curriculum planning and organization, methodology, selection and use of materials of health education, evaluation, basic health knowledge. (Spring—day)
- 131 **Tests and Measurements in Physical Education** (3) Staff
 Lecture (2 hours), conference (1 hour). Critical survey of tests in physical activities, methods of test construction, elementary statistics. (Fall—day)
- 134 **Rhythmic Analysis through Creative Movement** (3) DeBoeck
 Pulse, meter, phrase, simple music notation, and analysis of elementary forms of music composition. Sensory and ideational stimuli, music, poetry, and the visual arts as motivation for improvisation and choreography. Prerequisite: one semester of modern dance or ballet, or equivalent. (1971-72 and alternate years: spring—day)
- 135-36 **Survey of Dance History** (3-3) Burtner
 Dance from primitive ritual to contemporary folk, art, and ethnic forms. Practical work in dance included. PE 135: prehistoric to 20th century.

- PE 136: 20th century. (1970-71 and alternate years: academic year—evening)
- 138 **Organization and Administration of Physical Education** (3) George
Organization and administration of elementary, secondary, and college programs. Plants, fields, equipment, and programs. (Fall)
- 139 **Preparation and Evaluation of Student Teaching** (3) George, Hanken
(Fall and spring)
- 157 **Dance Technique and Theory** (1) Withers
Theories of movement; analysis and practice of contemporary dance techniques. (Spring—day)
- 158 **Safety Education** (3) Bumgarner
Liability, prevention, and emergency care of all types of injuries with reference to first aid and athletics. Proper use of personnel, facilities, and equipment. Red Cross certification as an instructor. (Spring—day)
- 164 **Physiology of Exercise** (3) Berube
The physiological functions of the body and the effect of exercise on these functions. Prerequisite: PE 49 and 50, or equivalent. (Fall—evening)

THIRD GROUP

- 201 **Philosophy and Organization of Physical Education** (3) Breen
Concepts of philosophy and philosophic method applied to objectives, principles, and practice in physical education. (Fall—evening)
- 202 **Motor Learning** (3) Staff
Theories of motor development and learning; variables of motor performance and learning with implications for teaching movement skills. (Spring—evening)
- 211 **Problems and Modern Trends in Physical Education** (3) Hanken
Lecture (2 hours), conference (1 hour). For experienced teachers. Organization, supervision, and curriculum problems growing out of current issues; program planning policies; competition.
- 215 **Administration of High School Athletics** (3) Millan*
Offered only by the College of General Studies in off-campus centers. Open only to majors in Physical Education. Lecture (2 hours), conference (1 hour). For the prospective high school athletic director. The philosophy, principles, and procedures essential for the administration and development of a sound athletic program. (Fall—evening)
- 220 **Problems in Health Education** (3) Jesnak
Lecture (2 hours), conference (1 hour). Health needs, policies and program planning, use of community resources, promising practices in the field. (Fall—evening)

* Mr. Millan is Associate Professorial Lecturer in Physical Education in the College of General Studies.

- 232 Current Issues in Elementary School Physical Education (3)** Snodgrass
Current philosophy, trends, and research; implications for curriculum, instruction, evaluation. (Spring—evening)
- 234 Organization and Administration of Elementary School Physical Education (3)** Snodgrass
For school administrators, supervisors, principals, and physical education specialists. Curriculum, administrative, and supervisory problems; kindergarten, grades 1-6. (1970-71 and alternate years: spring—evening)
- 241 Physical Examinations and Correctives (3)** Nashman
Examination for detection of postural defects, faulty body mechanics, and physical fitness; exercise prescription. Clinical experience. Prerequisite: PE 105 or equivalent. (Spring—evening)
- 242 Recreation for Special Groups (3)** Hawkins
Organization and administration of a community-oriented program for the mentally retarded; those with orthopaedic, neurological, cardiovascular, and other handicapping conditions; and the culturally deprived. All age groups included. (Spring—evening)
- 250 Recreation and Outdoor Education (3)** Thompson
Lecture (2 hours), conference (1 hour). Current trends in philosophy, principles, practices, and programs for outdoor education, camping, and community-school relationships. (Fall—evening)
- 258 Safety Education—Care and Prevention (3)** Millan*
Offered only by the College of General Studies in off-campus centers. Care and prevention of athletic injuries, school safety, first aid, and liability. Leads to Instructor Certification in First Aid. (Fall—evening)
- 261 Driver and Safety Education I (3)** Scott
History, scope, objectives. Automobile construction and maintenance, traffic accidents, laws, regulations, sound driving practices, responsibilities, and liabilities; emphasis on practice driving laboratory experiences. (Fall—evening)
- 262 Driver and Safety Education II (3)** Scott
Methods and techniques of conducting programs, pupil and program evaluation, research, planning, organization and instruction in modern approaches, laboratory and direct experiences in the utilization of multiple car and simulator approaches to instruction. (Spring—evening)
- 263 Basic Simulation—Driver Education (3)** Pitts†
Offered only by the College of General Studies in off-campus centers. Orientation and psychological foundations of simulator instruction. Operation, care, and preventive maintenance; organization and administration of a driver education simulator program. (Fall—evening)

* Mr. Millan is Associate Professorial Lecturer in Physical Education in the College of General Studies.

† Mr. Pitts is Lecturer in Physical Education in the College of General Studies.

264 Safety Education (3) Castell*
Extraneous influences that cause vehicular accidents—such as alcohol, drugs, suicidal tendencies, emotional and psychological factors, medical reasons—and their effects upon driver safety. (Spring—evening)

265 Driver and Safety Education III (3) Scott
Modern methods and materials in traffic safety and driver education; psychological testing; Drivucator; multiple car method.

270 Philosophy of Dance (3) Burtner
Study of the theories and concepts underlying dance from the 18th century to the present. (1970-71 and alternate years: fall—evening)

271-72 Dance Notation (3-3) Staff
Study of Labanotation. PE 271: leads to elementary certification; effort-shape notation included. PE 272: intermediate level. Special project: study and reconstruction of notated works of 20th century choreographers of American modern dance. (1971-72 and alternate years: academic year—day)

273 Advanced Choreography (3) Burtner
Advanced problems in creative movement and composition. Choreographing of group and solo works in dance. May be repeated once for credit. (Fall and spring)

277 Dance Expressions in Selected Cultures (3 or 6) Burtner
Study of ethnic forms of dance through reading and participation. Study may be done in the United States or the country of the dance being studied. (Fall and spring)

297 Advanced Topical Studies (3) Staff
Independent study or field project pertinent to the needs of the student, including synthesis and critique of background literature. (Fall and spring)

Physics

Professors G.M. Koehl, Herbert Jehle, H.H. Hobbs, Julian Eisenstein (*Chairman*), Otto Bergmann, A.J. Zuchelli
Associate Professor Francisco Prats
Associate Professorial Lecturers H.H. Landon, Jr., Herbert Rabin
Assistant Professors Margaret Montzka, J.M. Harrison, N.K. Khatcheressian, W.C. Parke

Bachelor of Arts or Bachelor of Science with a major in Physics (Departmental).—
Prerequisite: the Arts and Letters or the Science curriculum, respectively, pages 78-79, including Phys 1, 2, 31-32, 51-52; Chem 11-12; Math 31, 32, and 33, or former Math 21, 22, 23, and 24.
Required: the general requirements, pages 83-87, including (1) Phys 151 or 152, 161, and 165; (2) 12 semester hours of intermediate Physics courses, to be selected

* Dr. Castell is Assistant Clinical Professor of Medicine in the School of Medicine.

with the approval of the departmental adviser; (3) 6 semester hours selected from Math 111, 112, 124, 134, 139, 140, 142; (4) Stat 97 or EE 51.

Master of Arts in the field of Physics.—Prerequisite: a Bachelor's degree with a major in Physics at this University, or equivalent.

Required: the general requirements, pages 91–97, including Phys 231, 232, 233–34, 235, 236, 291, plus one of the following: Phys 241, 242, 243, 244, 245, or 251–52.

Doctor of Philosophy fields of study in Physics: Experimental Solid State Physics (Behavior of Electrons in Solids, Growth and Perfection of Crystals, Magnetic Properties of Solids at Low Temperatures, Mössbauer Effect), and Theoretical Physics (Biophysics, Elementary Particles, Field Theory, General Relativity, Magnetic and Optical Properties of Solids, Molecular Structure, Nuclear Scattering, Quantum Mechanics).—See pages 91–95, 97–99, for requirements for the degree.

Doctor of Philosophy in the field of Biophysics (an interdepartmental field offered by the departments of Biological Sciences, Physics, and Physiology, see pages 214–17).—See pages 91–95, 97–99, for requirements for the degree.

Bachelor of Arts in Education with a teaching field in Physics.—Prerequisite: the Education curriculum, page 80.

Required: the Physics option and the professional courses listed on pages 113, 115–16.

Departmental prerequisite: Phys 31–32 or equivalent, and consent of a departmental adviser, are prerequisite to all second-group courses in Physics.

ASTRONOMY

FIRST GROUP

9–10 Introduction to Astronomy (3–3)

Lecture (2 hours), recitation (1 hour), laboratory (2 hours). Classical through modern astronomy with introduction to basic principles underlying astronomical systems and observations. Primarily for nonscience majors. Laboratory fee, \$11 a semester. (Academic year—day) Hobbs

*11–12 Introduction to Astronomy (2–2)

Same as Phys 9–10 without the laboratory. (Academic year—day) Hobbs

PHYSICS

FIRST GROUP

1 General Physics (4)

Topics in classical physics which form a foundation for modern physics. Prerequisite: two years of college preparatory mathematics or concurrent registration for Math 6. Laboratory fee, \$11. (Fall—day and evening; spring—day) Koehl

2 Introduction to Modern Physics (4)

(Formerly General Physics)

Selected topics in modern physics, including electromagnetic phenomena. Prerequisite: Phys 1 or equivalent. Phys 1 can be waived on the basis of the College Entrance Examination Board Achievement Test or by a Staff

* This course does not satisfy the Columbian College of Arts and Sciences science requirement. This course may not be taken by students who have completed, or are enrolled in, or plan to enroll in Phys 9–10.

departmental examination prior to registration. Laboratory fee, \$11.
(Fall—day; spring—day and evening)

*3 **General Physics (3)**

Koehl

Same as Phys 1 without laboratory. (Fall—day and evening; spring—day)

†4 **Introduction to Modern Physics (3)**

Staff

Same as Phys 2 without laboratory. (Fall—day; spring—day and evening)

5 **Topics in Contemporary Physics (3)**

Parke

Discussion of current developments based on recent *Scientific American* articles in the physical sciences. Topics include relativity, quantum theory, elementary particles, lasers, Mössbauer effect, etc. Prerequisite: high school physics and two years of college preparatory mathematics.

31-32 **Introduction to Theoretical Physics (2-2)**

Staff

Theoretical structure of physics, emphasis on appropriate analytical techniques. Prerequisite: two semesters of calculus and Phys 2. (Academic year)

51-52 **Introduction to Experimental Physics (2-2)**

Staff

Experiments and lectures on the basic phenomena of physics and techniques of experimentation. Prerequisite: Phys 2 and two semesters of calculus. Material fee, \$11 a semester. (Academic year—day and evening)

SECOND GROUP

151-52 **Intermediate Laboratory (2-2)**

Staff

Independent advanced work to introduce students to laboratory and shop techniques and the use of specialized instruments. Prerequisite: Phys 51-52. Laboratory fee, \$11 a semester. (Academic year)

161 **Mechanics I (3)**

Staff

Mechanics of mass points and rigid bodies. Newton's laws, conservation laws, Euler's equations, inertia tensor, small vibrations, and elements of Lagrange's and Hamilton's equations. (Fall—day)

162 **Mechanics II (3)**

Staff

Basic aspects of elasticity and fluid dynamics, strain tensor, stress tensor, equations of equilibrium, elastic waves, ideal and viscous fluids. (Spring)

163 **Optics (3)**

Staff

Oscillations and waves, energy and momentum of the electromagnetic field, interference, diffraction, geometrical optics, optics of crystals and other media, dispersion. (Fall—day)

* This course does not satisfy the Columbian College of Arts and Sciences science requirement. This course may not be taken by students who have completed, or are enrolled in, or plan to enroll in Phys 1.

† This course does not satisfy the Columbian College of Arts and Sciences science curriculum. This course may not be taken by students who have completed, or are enrolled in, or plan to enroll in Phys 2.

164 Thermodynamics (3)

Basic principles of thermodynamics, reversible changes, applications to simple systems, thermodynamic potentials, phase equilibrium. (Spring) Staff

165-66 Electromagnetic Theory (3-3)

Development of Maxwell's field equations using vector and tensor calculus, electrostatics, stationary and nonstationary phenomena, basic circuit theory, electromagnetic waves and radiation. (Academic year) Staff

167 Principles of Quantum Physics (3)

Experimental background and theoretical basis of quantum mechanics. (Fall—day) Staff

168 Applied Quantum Physics (3)

Applications of quantum mechanics to statistical mechanics and to atomic, molecular, and nuclear physics. (Spring) Staff

170 Elementary Solid State Physics (3)

Dielectric and magnetic properties of solids, behavior of electrons in metals and semi-conductors, lattice defects. (Spring—evening) Staff

172 Biophysics (3)

Biosynthesis of macromolecules: physical basis of nucleic acid replication, transcription, and translation; information theory. Specificity of interaction of cells in reaggregation and morphogenesis. Symmetry in biological organization. (Spring) Jehle

175 Nuclear Physics (3)

Structure and stability of atomic nuclei, nuclear transformations and reactions, radiations of nuclei, fission. (Fall—evening) Staff

THIRD GROUP

Consent of a departmental graduate adviser is required for admission to all third-group courses in Physics.

231 Electromagnetic Theory: Macroscopic Effects (3)

Aspects of electromagnetism having to do with fields in the vacuum and in media, their determination in terms of physical boundary conditions and their effects upon charges and matter; definition of field quantities, experimental field relations, solutions for the fields, effects of dielectrics and magnetic media, time dependent solutions, and basic aspects of optics. (Fall—day) Eisenstein

232 Advanced Mechanics (3)

Analytic methods of mechanics as a basis for modern theory: variational principles, Lagrange's equations, Hamiltonian formulation, canonical transformations, classical perturbation theory, transition to continuum. (Fall—evening) Hobbs

233-34 Quantum Mechanics (3-3)

General aspects of quantum mechanics with emphasis upon the developmental principles involved. Operators, representations and transformation theory, Schrodinger and Heisenberg pictures, angular momentum, perturbation theory, scattering theory. (Academic year) Prats

- 235 **Special Relativity (3)** Bergmann
Application of relativistic concepts to the basic fields of physics: space and time, tensors and covariant mechanics of point particles, covariant form of electromagnetism, relativistic variational principles, relativistic quantum equations. (1970-71 and alternate years: fall-day)
- 236 **Electromagnetic Theory: Electrodynamics and Radiative Effects (3)** Staff
Lienard-Wiechert potentials, multipole fields, covariant methods, the self-field problem, and classical radiation theory. (Spring)
- 241 **Statistical Mechanics (3)** Jehle
Atomic configurations under thermodynamic conditions using partition functions and cluster expansion techniques; ideal and nonideal gases; electron plasmas; changes of state. (Spring)
- 242 **Atomic and Molecular Structure (3)** Staff
Structure of atoms and molecules, energy levels, binding energy, optical activity. Hartree and Hartree-Fock equations, spin-effects, rotational and vibrational effects, paramagnetic resonance, chemical binding. (Spring)
- 243 **Solid State Physics: Structure and Binding (3)** Staff
Atomic structure of solids and analysis of the binding of crystals. Crystal-line forms and symmetries, atomic vibrations and specific heats, sound and optical propagation, crystalline defects. (1971-72 and alternate years: fall)
- 244 **Solid State Physics: Electronic Processes in Metals (3)** Staff
Phenomena in metals and semi-conductors determined by the electronic states allowed: binding, specific heats, magnetic properties, transport phenomena. Independent particle approximation and many-body aspects are discussed. (1971-72 and alternate years: spring)
- 245 **Quantum Electrodynamics: Theory and Applications (3)** Zuchelli
A presentation of the lower order effects depending upon the quantal nature of the electromagnetic field: Hamiltonian formulation and field quantization, perturbation calculations, Compton effect, photoelectric effect, electron-electron scattering, pair creation and annihilation, indices of refraction, divergence difficulties. (Fall)
- 246 **Quantum Field Theory (3)** Bergmann
Covariant presentation of general theory of quantized fields, Boson and Fermion fields, theory of S-matrix, dispersion relations, and renormalization program. (Spring)
- 247 **Nuclear Theory (3)** Prats
Nuclear interactions, nuclear models, theory of nuclear reactions, pion physics and weak interactions. (1971-72 and alternate years: spring)
- 248 **Elementary Particles (3)** Jehle
Scalar, vector, and spinor fields and their particle aspects, weak and strong interactions, symmetry properties and conservation laws. (Spring)
- 249 **Statistical Processes (3)** Zuchelli
Extension of statistical concepts to irreversible processes. Ergodic behavior, classical and quantum approaches to irreversible effects in large systems,

master equations, recurrence paradox and development of thermodynamic concepts. (1970-71 and alternate years: fall—evening)

250 Selected Topics in Modern Physics (3)

Staff

Complements the established curriculum by affording formal instruction in topics of immediate interest to the development of physics and in particular to the members of the graduate research group. May be repeated for credit with permission of graduate adviser. (Fall and spring)

251-52 Laboratory (2-2)

Staff

Individual work on special topics. Laboratory fee, \$11 a semester. (Academic year: Saturdays)

254 General Theory of Relativity (3)

Bergmann

Physical principles and mathematical methods underlying Einstein's field equation, geodesic equations of motion, checks of the theory, action principle, conservation laws, perturbation theory, gravitational radiation theory, relativistic cosmology. (Spring)

291 Seminar (1)

Staff

Individual investigation of special problems. All students registered for Master's degree in physics are expected to attend this seminar during residence for the degree, and to take part in its programs. Credit for participation in the seminar work is obtained during the last two semesters of residence; this credit, however, is based upon the seminar work during the entire period of residence. May be repeated once for credit. (Fall and spring)

299-300 Thesis Research (3-3)

Staff

(Academic year)

FOURTH GROUP

398 Advanced Reading and Research (arr.)

Staff

Limited to students preparing for the Doctor of Philosophy general examination. May be repeated for credit. (Fall and spring)

399 Dissertation Research (arr.)

Staff

Limited to Doctor of Philosophy candidates. May be repeated for credit. (Fall and spring)

Physiology

Professors C.S. Tidball (*Chairman*), R.A. Kenney, Elizabeth Tidball (*Research*)
Professorial Lecturers Leonard Laster, K.R. Coburn
Associate Professors Marie Cassidy, R.P. Kernan (*Visiting*)
Associate Professorial Lecturers P.G. Nelson, R.J. Podolsky, W.A. Hagins,
 R.H. Adamson
Assistant Professors Elizabeth Stephenson, M.J. Jackson, R.A. Lavine
Assistant Professorial Lecturer W.L. Haskell
Special Lecturers L.L. Langley, H.J. Zimmerman

Master of Science in the field of Physiology.—Prerequisite: a Bachelor's degree. No major is specified, but the undergraduate program must have included the following courses or equivalent: B Sc 11–12; Chem 11–12, 22, 51–52, 53–54; Math 31 or former 22; Phys 1, 2.

Required: the general requirements, pages 91–97. In addition to the thesis, the 30 hours of required work should include Phyl 201, 221, 298, and at least 3 semester hours of research (Phyl 295).

Doctor of Philosophy fields of study in Physiology: Applied Physiology, Cardiovascular Physiology, Cellular Physiology, Endocrine Physiology, Gastrointestinal Physiology, Neurophysiology, Renal Physiology, and Respiratory Physiology.—See pages 91–95, 97–99, for requirements for the degree.

Doctor of Philosophy in the field of Biophysics (an interdepartmental field offered by the departments of Biological Sciences, Physics, and Physiology, see pages 214–17).—See pages 91–95, 97–99, for requirements for the degree.

Departmental prerequisite: Phyl 201 or equivalent is prerequisite to all courses in Physiology numbered above 201.

191 Selected Topics in Human Structure and Function (3)

Kenney

Lecture (2 hours), laboratory (1 hour). Structural and functional basis of physiology. A required course for graduate students who have not had Anat 201 or equivalent. Content of this course is on the undergraduate level; students may receive graduate credit on completion of additional work as prescribed by the instructor. Prerequisite: B Sc 11–12 or equivalent and consent of instructor. Open to Columbian College of Arts and Sciences students only with the approval of the student's major adviser. (Fall—day)

201 Physiology (8)

Staff

Lecture (8 hours), laboratory (2 hours), conference (1 hour). Cellular organ system, and applied mammalian physiology. Prerequisite for graduate students: Anat 201 or Phyl 191, or equivalent; Bioc 201 or 221–22 (Bioc 222 may be taken concurrently); or consent of Chairman of Department. Nonmedical students please note that the first meeting of the course occurs one week before the start of University campus classes. Open to Consortium students only with permission of Department Chairman. (Spring—day)

221 Seminar (1)

Stephenson

Staff and student presentations from literature. Present work discussed, experimental design and scientific deduction evaluated. Topics to be announced. Prerequisite: a reading knowledge of French or German. Content differs each time the course is offered; may be repeated for credit. (Fall and spring—day)

251 History of Medicine (1)

E. Tidball

Survey of the great contributors to physiology and medicine in the context of the times in which they lived and worked. (Fall—day)

252 Physiological Basis of Sexuality (1)

E. Tidball

Conference 1 hour a week. Human reproduction, neonatal changes, contraception, sterility; their implications on patient counseling. (Fall—day)

- 253 **Clinical Applications of Physiology** (1) C. Tidball
Conference 1 hour a week. Emphasis on acid-base and fluid-balance physiology and its relation to clinical problems.
- 256 **Aerospace Physiology** (1) Coburn
Conference 1 hour a week. Discussion of physiological problems involved in aviation and space technology. (Fall—day)
- 261 **Gastrointestinal Physiology** (2) Staff
Lecture or conference 2 hours a week. Physiological approach to such clinical problems as peptic ulcer, malabsorption, ulcerative colitis, hepatitis, and others. (Fall—day)
- 262 **Cardiovascular Physiology** (2) Kenney
Lecture or conference 2 hours a week. An overview of cardiovascular physiology at an advanced level. (Fall—day)
- 263 **Endocrine Physiology** (2) Jackson
Lecture or conference 2 hours a week. Basic physiology underlying clinical derangements involving abnormal endocrine functions.
- 264 **Basic Science in Clinical Medicine** (2) Laster
(Formerly *Advanced Physiology of Metabolism*)
Conferences on basic and clinical research which have brought new understanding to disease states characterized by inborn errors of metabolism. (Fall—day)
- 267 **Renal Physiology** (2) Kenney
Lecture or conference 2 hours a week. An overview of renal physiology at an advanced level.
- 271 **Electronic Instrumentation** (3) Lavine
Lecture (2 hours), laboratory (2 hours). Fundamentals of electronics and their application to the measurement of physiological phenomena. Prerequisite: Math 31 or former 22; Phys 1, 2; and consent of instructor. (Fall)
- 272 **Mammalian Radiophysiology** (1) Jackson
Lecture or conference 1 hour a week. Basic physiology of radiation lethality.
- 273 **Investigative Electron Microscopy** (3) Cassidy
Lecture (2 hours), laboratory as arranged. Application of electron microscopy to biological investigative studies. Limited registration. Prerequisite: Anat 261 or equivalent. Admission by permission of instructor. (Fall—day)
- 295 **Research** (arr.) Staff
By special arrangement with individual Staff members. Approximately 4 clock hours in the laboratory for each semester hour credit. Content differs each time course is offered; may be repeated for credit. (Fall and spring)
- 298 **Comprehensive Physiology** (2) Staff
Guided review of selected areas of Physiology appropriate to the student's graduate program. This course satisfies the requirements for the Master's

Comprehensive Examination, the Field Examination for doctoral students minoring in Physiology, and Part I of the Cumulative General Examination in Physiology. Prerequisite or concurrent registration: Phyl 221. (Fall)

299-300 **Thesis Research (3-3)** Staff
(Academic year)

396 **Advanced Reading and Research (2)** Staff

Limited to students preparing for the Doctor of Philosophy general examination. Tutorial literature survey of a subfield of Physiology and of pertinent areas of the candidate's minor field. This course satisfies the requirement for Part II of the Cumulative General Examination in Physiology. (Fall and spring)

398 **Development of Dissertation Problem (2)** Staff

Limited to students preparing for the Doctor of Philosophy general examination. Preparation for written and oral presentation of dissertation problem. This course satisfies the requirement for Part III of the Cumulative General Examination in Physiology. (Fall and spring)

399 **Dissertation Research (arr.)** Staff

Limited to Doctor of Philosophy candidates. May be repeated for credit. (Fall and spring)

Political Science

Professors J.W. Brewer, W.H. Kraus, R.E. Purcell, H.M. Stout, H.L. LeBlanc (Chairman), Benjamin Nimer, H.C. Hinton, Andrew Gyorgy, B.M. Sapin
Professorial Lecturers F.M. Riddick, F.L. Hadsel, Bernard Gordon
Associate Professors J.A. Morgan, Jr., C.F. Elliott, Bernard Reich
Adjunct Associate Professor Donald Robinson
Associate Professorial Lecturers John Hanessian, Jr., Robert Ellert, C.A. Linden
Assistant Professors D.T. Allensworth, S.J. Wayne, J.M. Logsdon
Assistant Professorial Lecturer J.D. Stempel
Instructor K.L. Storrs

Bachelor of Arts with a major in Political Science (Departmental).—Prerequisite: the Arts and Letters curriculum, page 78, including P Sc 5-6 and Stat 51 or 53.

Required: in addition to the general requirements, pages 83-87, 30 semester hours of Political Science courses including P Sc 105 and 6 semester hours from each of Groups A, B, C, and D, listed below. The 6 semester hours selected from Group A must include P Sc 117 or 118; the 6 semester hours from Group B must include P Sc 103 or 104 or 122 or 145; the 6 semester hours from Group C must include P Sc 111 or 112; the 6 semester hours from Group D must include P Sc 171 or 181 or 182.

Group A: Political Theory, History of Political Thought, and Methodology—P Sc 107, 117-18, 119-20, 141, 160, 198; Group B: American Government and Politics—P Sc 103-4, 121-22, 125, 126, 145, 146, 151, 167, 199; Group C: Comparative and Foreign Government and Politics—P Sc 101, 111, 112, 113, 115, 161, 162, 177, 178, 190, 191, 192, 193, 194, 196; Group D: International Politics, Law, and Organization—P Sc 163, 171, 172, 181-82, 189, 197.

Political Science majors may apply for graduation with Special Honors. In order to be recommended by the Department for Special Honors, students must fulfill the general requirements (see page 49) and must complete with distinction a project of independent study, as demonstrated in a written paper, in addition to the normal credit requirements of particular courses. A committee of the Department will review the paper and make the recommendation for Special Honors.

Students who wish to undertake independent study for Special Honors should register with the secretary of the Department no later than the second week of each semester, and then consult with a member of the Department whose specialized interests lie in the area of the proposed research project. Students registered for P Sc 150 may qualify for graduation with Special Honors by completing with distinction the work connected with their internship.

Master of Arts in the field of Political Science.—Prerequisite: a Bachelor of Arts degree with a major in Political Science at this University (or equivalent major elsewhere) with a B average (or better) in the major.

Required: the general requirements, pages 91–97. The 30 hours of required work must be approved in advance by the adviser.

Doctor of Philosophy fields of study in Political Science: American Political Process and Behavior, Comparative Government and Politics, Constitutional Law and Judicial Politics, International Law, International Politics, International Organization, Political Theory (Normative and Empirical), State and Urban Politics, The Presidency and the Administrative Establishment, U.S. Foreign Policy, and Politics of Latin America, Soviet Union, Eastern Europe, Western Europe, Far East, South and Southeast Asia, Africa (south of Sahara), Middle East.—See pages 91–95, 97–99, for requirements for the degree.

Doctor of Philosophy fields of study in International Relations combine work in Economics, History, and Political Science.

Departmental prerequisite: P Sc 5–6 is prerequisite to all second-group courses in Political Science.

FIRST GROUP

5–6 Introduction to Political Science (3–3)

P Sc 5: an introduction to the study of comparative political systems. Emphasis on contemporary concepts and techniques used to examine politics and government. P Sc 6: structure, powers, and processes of the American political system—Congress, the President, and the Supreme Court; elections, political parties, and pressure groups; state and local governments. (P Sc 5: fall—day; spring—evening. P Sc 6: fall—evening; spring—day.)

SECOND GROUP

101 Far East in the Modern World (3)

General character of Far Eastern societies and their response to the impact of America, Europe, and Russia; American policy in the Far East and the influence of world communism. (Fall—day)

103–4 State and Local Governments (3–3)

(Replaces former P Sc 103 Metropolitan Government and Politics and P Sc 104 State and Local Governments)

P Sc 103: state and local political systems, theory of sub-national governments, intergovernmental relations, metropolitan government and politics. P Sc 104: urban political systems, issues in urban politics, city and regional planning, and the political process. (Academic year—day)

Michael

Allensworth

- 105 Scope and Methods of Political Science (3)** Wayne
Development of the discipline to its present state, nature of political inquiry, major approaches to the study of politics, empirical methods of political research. (Fall and spring—day)
- 107 Problems in Modern Political Thought (3)** Elliott, Kraus
Development of democratic political institutions and analysis of main ideological changes during the 19th and 20th centuries; attention to the rise of socialism, communism, and fascism.
- 111 Comparative Government and Politics (3)** Elliott, Gyorgy
Introduction to the government and politics of the principal constitutional democracies of Western Europe: Great Britain, France, and the Federal Republic of Germany; secondary reference to other West European systems and the communist government of East Germany. (Fall—day and evening)
- *112 Comparative Government and Politics (3)** Purcell
Introduction to the government and politics of the communist nations; emphasis on the Soviet Union and the countries of Eastern Europe. (Fall—evening; spring—day and evening)
- 113 Political Problems of the British Commonwealth (3)**
From Colonial Empire to modern Commonwealth: questions of equal partnership; governments and policies in principal Commonwealth states; problems of new states in Asia and Africa.
- *115 Government and Politics in Eastern Europe (3)** Gyorgy
Study of the contemporary social and ethnic structures, governmental systems, and international position of the East European satellites. Emphasis on the post-World War II political evolution and present status of Soviet satellite nations.
- 117-18 Political Theory: Nature and Growth of Western Political Thought (3-3)** Kraus
P Sc 117: foundations of Western political thought with emphasis on classical antiquity; Western political tradition. P Sc 118: the Renaissance and Reformation to recent times. Theoretical foundations of the modern state: morals and politics, sovereignty, absolutism, obedience, and resistance; liberalism, democracy, conservatism. (Academic year—day)
- 119-20 American Political Thought (3-3)** Brewer, Morgan, Allensworth
Introduction to political thought in the United States from colonial times to the present. (Academic year—day)
- 121-22 U.S. Constitutional Law and Politics (3-3)** Morgan
P Sc 121: separation of powers, federal-state relationships, economic regulation. P Sc 122: political and civil rights. Prerequisite: junior status. (Academic year—day)
- 125 The American Congress (3)** Robinson
(Formerly *Legislative Organizations*)
Congress: the legislative process of the House of Representatives and Senate. The men, the committees, and the system. (Fall—evening)

* P Sc 112, 115, and 161 are related in their subject matter, and credit for only one of the three may be applied toward a degree.

- 126 **The American Presidency** (3) Wayne
 Role of the Presidency in public policy formulation, development of the institution, the selection process, emphasis on legislative-executive relations. (Spring—day)
- 141 **Development of Legal Institutions** (3) Brewer
 Introduction to historical jurisprudence: primary attention to the origins of Roman Law of Continental Europe and of Anglo-Saxon Common Law. (Spring—day)
- 145 **Political Parties and Politics** (3) LeBlanc, Robinson
 Organization and operation of political parties in the United States: party system and structure, role of ideology, voting behavior, campaigns and elections, devices for organizing the government. (Fall—evening; spring—day)
- 146 **Political Pressures and Public Reactions** (3)
 Public opinion, special interest lobbies, and pressure groups as they operate on government to influence public policy. (Spring—day)
- 150 **Internship in Politics** (3) Wayne, Robinson
 Study of the political process in action by assignment to a congressional, state, or local government office to pursue a specific research project. Admission by selection of a departmental committee, with priority given to seniors majoring in Political Science. Papers judged meritorious qualify students for Special Honors in Political Science. (Fall and spring)
- 151 **Public Administration** (3) Allensworth
 Theory and practice of governmental administration, administrative systems in the public and private sectors, introduction to organization theory and behavior. (Fall—day)
- 160 **Modern Communist Ideologies** (3) Elliott
 Intensive study of 20th century communism; emphasis on its antecedents and possible evolution. Backgrounds, careers, and ideas of leading communist figures: Marx, Lenin, Stalin, Khrushchev, and Mao.
- *161 **Soviet Government and Politics** (3) Linden
 Analysis of influences in the formation of the Soviet system under Lenin, Stalin, and Khrushchev; the Soviet Communist Party; government and mass organizations; selected aspects of economic, cultural, social, and foreign policy.
- 162 **Government and Politics of China** (3) Staff
 The Chinese Revolution: Chinese tradition, modern Chinese history, Marxism-Leninism and Soviet influence; the rise of the Communist Party of China. Principal power structures: party, bureaucracy, armed forces, police. Major domestic and foreign objectives and policies. Students cannot receive credit for both P Sc 162 and 194.
- 163 **Soviet Foreign Policy** (3) Elliott
 Relations with United States, Third World, China; international communism; disarmament policy; instruments of foreign policy; interrelationships

* P Sc 112, 115, and 161 are related in their subject matter, and credit for only one of the three may be applied toward a degree.

of domestic and foreign policies; ideology and foreign policy. (Fall—day)

167 U.S. Foreign Policy (3) Staff

Constitutional and political factors that determine the formulation, execution, and substance of U.S. foreign policy. (Fall—day)

171 International Politics (3) Reich, Jordan, Storrs

International actors, international and domestic environments of foreign policy, global and regional patterns, general characteristics of foreign policy. (Fall—day and evening; spring—day)

172 International Organization (3)

Development and operations of the United Nations, regional organizations, and functional international organizations. (Spring—day and evening)

177 Governments and Politics in Latin America (3) Storrs

Political processes and institutions in Latin America; emphasis on Argentina, Brazil, Chile, and Mexico. (Fall—day)

178 Latin America: Political Patterns and International Relations (3) Storrs

Patterns of political development, foreign policies of selected states, inter-American diplomacy and organization, United States-Latin American relations. (Spring—day)

181-82 Public International Law and Organization (3-3) Brewer

Survey of the public law of nations. P Sc 181: emphasis on the law of peace. P Sc 182: continuation of the law of peace; attention to neutrality and the so-called law of war. (Academic year—day)

189 African International Politics (3) Nimer

Analysis of interstate relations in Africa and of selected aspects of African relations with the outside world. (Spring—day)

190 Politics of Middle and Southern Africa (3) Nimer

Comparative analysis of the political systems of selected countries of non-Mediterranean Africa. (Fall—day)

191 Governments and Politics of the Middle East (3) Reich

Domestic and international politics of the eastern Arab states, Turkey, Iran, Israel. (Fall—day)

192 Governments and Politics of North Africa (3) Reich

Domestic and international politics of Algeria, Tunisia, Morocco, Libya, Egypt, Sudan; their relations with states of the Middle East. (Spring—evening)

193 Government and Politics of South and Southeast Asia (3) Hinton

Domestic and international politics of the major states in the area, particular reference to India. (Fall—evening)

194 Governments of China and Japan (3) Michael

Institutions and processes of government in contemporary China and Japan, with some historical background. Attention to ideological forces. Students cannot receive credit for both P Sc 194 and 162. (Spring—evening)

196 Problems of Modern Political Leadership (3)

Lectures and discussions on problems of political leadership in developing states.

197 Proseminar: International Affairs (3)

Purcell, Reich, Storrs

Diplomatic, economic, psychological, military problems of U.S. foreign policy. Readings, term papers, discussion. Primarily for seniors in the International Affairs curriculum; open to a limited number of other qualified students. (Fall and spring—day and evening)

199 American Government and Politics (3)

LeBlanc

Proseminar: reading and research as a basis for analyzing significant problems. Open to seniors in Public Affairs and Political Science curricula. (Spring—day)

THIRD GROUP

Graduate reading courses and seminars may vary in theme from year to year and may be repeated for credit with the approval of the student's adviser and the consent of the instructor.

201 Seminar: Scope and Methods of Political Science (3)

Wayne

Reading and research. (Fall—evening)

203-4 State and Local Governments (3-3)

Allensworth

P Sc 203: readings and group discussions on the process of politics at state and local levels. P Sc 204: readings and advanced research in selected topics of state and local politics. (Academic year—evening)

209 Seminar: the American Presidency (3)

Wayne

Reading and research on the institutionalized features of the American Presidency; emphasis on the politics of the Executive Branch. (Spring—evening)

210 Seminar: the American Congress (3)

Robinson

Reading and research on the Congress of the United States. (Fall—evening)

211 Readings in Comparative Government and Politics (3)

Methodological questions; comparative political processes and systems; some attention to legislatures, executives, parties, public services, the role of the military. (Fall—day)

212 Seminar: Comparative Government and Politics (3)

Selected topics in comparative political institutions and politics. Each semester is devoted to a selected country or significant institutional or policy problem. Attention is directed to questions of method. (Spring—day)

215-16 Seminar: the Communist Camp in World Politics I-II (3-3)

P Sc 215: significant issues of communism, particularly in the Soviet Union and Red China; concept and structure of "world socialist system"; intra-Bloc relations with emphasis on the Sino-Soviet dispute. Prerequisite: 3 semester hours in modern political theory. P Sc 216: political ramifications of the communist movement and its relations with the non-communist world. Prerequisite: 3 semester hours in international relations or comparative government.

217 Readings in Political Theory (3) Kraus

Readings and discussions, principally on modern political and constitutional theory since the 17th and 18th centuries; emphasis on basic themes and schools of thought. (Fall—evening)

218 Seminar: Topics in Political Theory (3) Kraus

Research and discussion on problems of modern political and constitutional theory; theoretical aspects of representative government, democracy, socialism, totalitarianism. (1970-71 and alternate years: spring)

221-22 The United States Constitution and the Judicial Function (3-3) Morgan

P Sc 221: readings and group discussions on constitutional law and politics. P Sc 222: seminar on selected topics of constitutional law and judicial behavior. (Academic year—evening)

224 Readings in Socialism and Communism (3) Kraus

Readings and discussions of primary and secondary works to explore genesis and transformations of a strand of political speculation—from pre-Marxian and Marxian socialism to contemporary Marxism-Leninism. Prerequisite: 3 semester hours in modern political theory. (Fall—day)

225 Seminar: Marxism-Leninism (3) Kraus

Crucial theoretical problems, such as the nature of revolution, dictatorship of the proletariat, transition to communism, imperialism, and national liberation in Marxian and contemporary communist doctrine. Prerequisite: P Sc 224 or permission of instructor. (Spring—evening)

227 Seminar: Governments and Politics of Eastern Europe (3) Gyorgy

Comparative study of principal political, social, economic institutions; Soviet stake; patterns of Soviet domination; efforts toward economic and political integration; impact of the Sino-Soviet dispute; U.S. policy toward satellite nations. (Spring—day)

229 Readings in Soviet Government and Politics (3) Elliott

Readings in contemporary Soviet domestic government and politics. Prerequisite: 3 semester hours selected from Hist 146, P Sc 112, or equivalent. (Fall—evening)

230 Seminar: International Communism (3) Metzl

Fall semester: emphasis on operational techniques. *Spring semester:* case studies. Students may receive credit for the fall semester and also the spring semester, but neither semester may be repeated for credit. (Fall and spring—evening)

***231 Seminar: Sino-Soviet Relations (3)** Michael

Background, development, and status of conflict within the communist movement; emphasis on the role of Chinese communists. Prerequisite: 3 semester hours selected from Hist 187; P Sc 101, 194; or equivalent. (Spring—day)

232 Seminar: International Communications (3) Dasbach

East-West perspectives. Theory and history of national patterns of international communications focusing on basic political and psychological

* An interdepartmental course offered by the departments of Political Science and History.

aspects of communication between major communist and noncommunist powers. (Spring—day)

233 Seminar: Soviet Government and Politics (3)

Elliott

Research seminar in selected problems of Soviet domestic government and politics. Emphasis: since Stalin. Prerequisite: P Sc 229 or permission of instructor. (Spring—evening)

234 The Soviet Political Process (3)

Ploss

Influence of revolutionary ideas, traditions, and accidental events on Soviet organization, and on administration of Soviet social, economic, national, and military policies; application of these policies by leaders to maintain power. (Fall—day)

235-36 City and Regional Planning Processes (3-3)

Allensworth

Examination of city and regional planning and land use processes. Role, significance, and nature of responsibilities of comprehensive and functional area planning agencies and organizations at the local, sub-regional, and metropolitan levels. Strategies of administrators and other participants in metropolitan planning decision making. Economic, social, political, and administrative influences on land use and planning in the metropolitan area. P Sc 235: readings and group discussion. P Sc 236: readings and advanced research. (P Sc 236: spring—evening)

***237 Chinese Law (3)**

Hsia

Emphasis on the legal system of Communist China; analysis of the constitutional law of the People's Republic of China, including general principles, state structure, and rights and duties of citizens; a brief survey of the administration of justice—courts, procuratorates, and lawyers; marriage law; land law; counterrevolutionary act and other criminal statutes; principles of civil law; communist Chinese concept of international law.

†238 Soviet Law (3)

Ramundo

Concept of "socialist legality"; legal relationship of individual to state and other participants in Soviet society; role of Party in Soviet legal system; Soviet philosophy of law; state (constitutional) law: Soviet federalism, governmental apparatus, rights and obligations of citizenship; criminal law; property law; labor law; selected topics in civil law and procedure; international law. (Fall)

245-46 The American Political Process (3-3)

LeBlanc

P Sc 245: readings and group discussions on the nature and functions of political parties and the role and techniques of political interest groups. P Sc 246: seminar on selected topics of American politics. (Academic year—evening)

253 Seminar: Chinese Government and Politics (3)

Michael

Political institutions and concepts in late imperial times, during the revolution, under national government, and under communism. Emphasis on the communist period. Prerequisite: 3 semester hours selected from Hist 187; P Sc 101, 194; or equivalent. (Fall—day)

* Same as Law 547 (2). Graduate students registering for P Sc 237 make special arrangements with the instructor for supplementary assignments equivalent to one additional semester hour.
† Same as Law 546 (2). Graduate students registering for P Sc 238 make special arrangements with the instructor for supplementary assignments equivalent to one additional semester hour.

254 Colloquium: Modern China (3)

Michael

Interuniversity research colloquium of faculty members of the Institute for Sino-Soviet Studies and other area universities from different disciplines concerned with the study of modern China. Critical discussions of research plans and studies in progress in weekly sessions. Advanced graduate students admitted with permission of faculty group. (Fall and spring—day)

255 Colloquium: Russia and Eastern Europe (3)

Gyorgy

Interuniversity research colloquium of faculty members of the Institute for Sino-Soviet Studies and other area universities from different disciplines concerned with the study of Russia and Eastern Europe. Critical discussions of research plans and studies in progress in weekly sessions. Advanced graduate students admitted with permission of faculty group. (Fall and spring—day)

257 Seminar: Communism in Developing Countries (3)

Examination of international communist policy for, and communist parties in, developing countries. Case studies of Asia, Africa, and Latin America. Basic communist concepts of imperialism and nationalism; development and current application of Soviet and Chinese variants of strategy and tactics for "national liberation."

258 Seminar: Communist Parties in the Noncommunist World (3)

Movements and ideological variations of communist parties of France, Italy, the Scandinavian countries, and other Central and West European nations. Case studies on communist problems of Middle East and North African nations.

265-66 Chinese Communist Policy Processes (3-3)

Hinton

Determinants of policy, view of the world, instrumentalities and locus power, interrelationship between domestic and foreign policy, formulation and implementation of policy. Prerequisite to P Sc 265: 3 semester hours selected from P Sc 101, 194, or equivalent. Prerequisite to P Sc 266: P Sc 265 or equivalent. P Sc 265: readings. P Sc 266: research seminar.

267 Seminar: U.S. Foreign Policy (3)

Purcell

Research and selected reading as the basis for an analysis of the foreign policy of the United States, with particular reference to the decision-making process and the execution of policy. (Fall—day)

268 Seminar: Comparative Foreign Policies (3)

Research and selected reading as the basis for an analysis of the foreign policies of major powers, with particular reference to the decision-making process and the execution of policy. (Spring—evening)

269 Seminar: Soviet Foreign Policy (3)

Elliott

External policies and relations of the USSR; world objectives of Soviet leaders; relations with other communist states, Western powers, and other countries; international propaganda, disarmament policy, foreign economic relations. Prerequisite: 3 semester hours selected from Hist 137, 145-46, or equivalent. (Spring—evening)

270 Political and Social Institutions of Eastern Europe (3)

Gyorgy

Major political and social factors which have shaped the inter-war, World War II, and post-war evolution of Eastern Europe. Emphasis on soci-

ological and anthropological forces which have contributed to "Balkanization" of this area in the last fifty years. Each time the course is offered the concentration will be on one or two selected countries. (Fall—day)

271-72 Problems in International Organizations (3-3)

P Sc 271: analysis of the political dimension of international organizations; special reference to the United Nations. P Sc 272: examination of the operational and administrative aspects of international organizations; special reference to regional and functional bodies. (Academic year—evening)

273 Public Opinion and Foreign Policy (3)

Development, organization, and operation of international information programs by major world powers. U.S. public opinion influencing foreign policy formation and conduct. (Spring—day and evening)

274 Principles and Problems of International Political Communication (3)

Reading and discussion of public opinion/foreign policy relationships and operation of international political communication programs by major world powers as a tool of foreign policy. (Fall—day)

275-76 International Politics (3-3)

P Sc 275: reading and discussion of recent and older works of theoretical significance, both empirical and normative. P Sc 276: individual research on and class discussion of selected international political topics. (Academic year—day and evening)

277-78 Seminar: Latin American Politics (3-3)

P Sc 277: readings and discussions on Latin American political processes and institutions. P Sc 278: individual research and class discussion on selected topics of Latin American politics. (Academic year—evening)

***280 Vietnam: Causes and Prospects (3)**

An interdisciplinary, area-centered approach, with primary stress on the causes of the war, but with attention also to the future of Southeast Asia as a whole. (Spring—day)

281-82 Seminar: Public International Law (3-3)

Research in the public law of nations, with special attention to problems of pacific settlement, sanctions, war, neutrality, and state jurisdiction, and to their political implications. (Academic year—day)

†283 Topics in International Law (3)

284 Seminar: Comparative Communist Systems (3)

A comparative examination of the major characteristics of communist systems—party history, structure, foreign policy, psychological influences, ideology, and modernization. Emphasis on methodological problems in comparative communist politics. (Spring—day)

†285 Diplomacy since World War II (3)

* An interdepartmental course offered by the departments of Political Science and Psychology.
† Offered in War College programs only.

- 287 **Seminar: Problems in Latin American Civilization (3)** Rodríguez
Interdisciplinary seminar, guided by a specialist in the methodology of his chosen discipline; each student writes a report on some aspect of a key theme (i.e., Nationalism) in Latin America's experience. Admission by permission of instructor. (Spring—day)
- 288 **Seminar: Soviet Military Policy and Strategy (3)** Staff
Soviet developments in military policy and strategy with attention to intra-Bloc military cooperation, political context of Soviet military policy, significant changes in recent Soviet military thought. (Fall or spring)
- 290 **Topics in African Politics (3)** Nimer
Reading, research, and discussion of selected aspects of African domestic and international politics. (Spring—evening)
- 291 **Governments and Politics of the Middle East (3)** Reich
Reading and research in selected problems in the government and politics and international relations of the Middle East. (Fall—evening)
- 292 **Governments and Politics of North Africa (3)** Reich
Reading and research in selected problems in the government and politics and international relations of North Africa. (Spring—evening)
- 293 **Seminar: Governments and Politics of South and Southeast Asia (3)** Purcell
Research and selected reading as basis for analysis of structure, problems, and policies of the governments of selected countries in the area, with particular reference to India. (Spring—evening)
- 294 **Seminar: Governments and Politics of Japan and Korea (3)**
Readings, research, and discussion on the contemporary political problems and relevant historical background of Japan, North and South Korea. (Fall or spring)
- 295 **Seminar: Chinese Communist Foreign Policy (3)** Hinton
Objectives; formulation and implementation of foreign policy; Communist China as Asian state, revolutionary influence, would-be power. Prerequisite: 3 semester hours selected from P Sc 101, 194, or equivalent.
- 296 **Seminar: the Communist Role in Far Eastern International Politics (3)** Hinton
Evolution of communist strategy for Asia, armed struggle in South and Southeast Asia, wooing of national bourgeoisie, development of Asian communist states, local communist parties since World War II, Sino-Soviet rivalry.
- 297 **Independent Studies (arr.)** Staff
Limited to Master's candidates. Permission of instructor, in writing, required. (Fall and spring)
- 298 **Southeast Asia in World Politics (3)** Gordon
Southeast Asia in great-power perspective. Overlapping and conflicting interests, foreign policies, and military requirements of the United States, Japan, China, and the USSR. Balance-of-power concept and development of Asian subsystem. (Spring—evening)

299-300 Thesis Research (3-3)

(Academic year)

Staff

FOURTH GROUP

398 Advanced Reading and Research (arr.)

Staff

Limited to students preparing for the Doctor of Philosophy general examination. May be repeated for credit. (Fall and spring)

399 Dissertation Research (arr.)

Staff

Limited to Doctor of Philosophy candidates. May be repeated for credit. (Fall and spring)

Psychology

Professors Thelma Hunt (*Emeritus*), E.L. Phillips, J.N. Mosél, B.I. Levy (*Chairman*), W.E. Caldwell, R.D. Walk, R.K. White, Gardner Murphy (*Visiting*)

Professorial Lecturers Margaret Ives, W.A. McClelland, J.E. Uhlaner

Associate Professors C.E. Tuthill, Eva Johnson, Virginia Kirkbride, Jacqueline

Goodnow, M.L. Meltzer, R.R. Bonato (*Research*), R.H. Tanck (*Research*),

D.E. Silber, Charles Rice, Eugene Abravanel, S.A. Karp

Adjunct Associate Professor C.J. Lange

Associate Professorial Lecturers R.K. Kahn, J.B. Margolin

Assistant Professors R.W. Holmstrom (*Visiting*), J.A. Bull III, Sally Sibley (*Research*)

Assistant Professorial Lecturer S.L. Cohen

Lecturer S.S. Smith

CLINICAL TRAINING STAFF

Associate Clinical Professors Katharine Beardsley, Elizabeth Broomhead, A.M. Rochlin, Donald Jewell, S.B. Kopp, I.M. Zimmerman, W.W. Sikes, Bruce

Becker, J.W. Cummings, Mimi Spielberg

Assistant Clinical Professors Alice Adams, Andrea Doman, J.M. Smothers, S.A. Fagen

Bachelor of Arts with a major in Psychology (Departmental).—Prerequisite: the Arts and Letters curriculum, page 78, and Psyc 1 and 5, or 1 and 6, or 5-6.

The general requirements for the degree are stated on pages 83-87. The 60 required semester hours, in addition to those taken as prerequisites, must include 24 hours in second-group Psychology courses, including Psyc 196 and one course from each of the following groups—Group A: Psyc 118, 121, 161; Group B: Psyc 115, 151, 156; Group C: Psyc 112, 129, 131, 144. Stat 53 or 104, or an appropriate course in mathematics, is required.

Master of Arts in the field of Psychology.—Prerequisite: the degree of Bachelor of Arts with a major in Psychology at this University, or equivalent.

Required: the general requirements, pages 91-97. Of the 24 required semester hours (exclusive of the thesis), a minimum of 18 must be in third-group Psychology courses including Psyc 202 and either 203 or 204; 6 may be in related fields approved by the Department. For detailed requirements consult the Chairman of the Department.

Doctor of Philosophy fields of study in Psychology: Psychology (Clinical, Developmental, Experimental, Industrial and Organizational, Social), and Personality and Psychopathology.—See pages 91–95, 97–99, for requirements for the degree.

Students electing Psychology courses in the freshman year should begin with Psyc 1; with permission of instructor students may elect Psyc 5–6 in the freshman year.

Departmental prerequisite: Psyc 1 or 5 or 6 is prerequisite to all other courses in Psychology. Six semester hours in Psychology courses are prerequisite to all second group courses in Psychology.

FIRST GROUP

1 General Psychology (3)

Staff

Fundamental principles underlying human behavior. (Fall and spring—day and evening)

5–6 Principles and Methods of Psychology (3–3)

Walk, Abravanel

Lecture (2 hours), laboratory (2 hours). An experimental approach to understanding behavior; individual and class experiments performed. Psyc 5: awareness, discrimination, sensation, perception, and emotions and their relation to adaptive behavior. Psyc 6: topics of motivation, learning, memory, and problem solving. Laboratory fee, \$6 a semester. (Psyc 5: fall—day and evening. Psyc 6: spring—day.)

8 Psychology of Motivation and Personality (3)

Tuthill, Silber, Rice, Holmstrom

Introduction to the psychology of personality. Principles of motivation, personality development, social and cultural factors, and assessment and description of personality emphasized. (Fall and spring—day and evening)

11–12 Introduction to the Psychology of Personality (3–3)

Murphy, Rice

Lectures, demonstrations, and discussions. Introduction to general psychology through the study of human personality. In-depth study of personality development, biological and sociocultural determinants, personality research methods, and theories of personality. Prerequisite to Psyc 12: Psyc 11. (Academic year—day)

22 Introduction to Educational Psychology (3)

Kirkbride, Tanck

Consideration of individual and group differences, adjustments, and the psychology of learning in relation to education and training. (Fall and spring—day)

29 Psychology of Childhood (3)

Johnson

Developmental approach to study of the child. Emphasis on the socialization process, learning, and the child's view of the world. (Fall—day; spring—evening)

SECOND GROUP

101 Abnormal Psychology (3)

Hunt, Meltzer, Silber, Rice

Causes, diagnosis, treatment, and prevention of various types of maladjustments and mental disorders. Prerequisite: 6 semester hours in psychology, or 3 in psychology and 6 in a biological science. (Fall and spring—day and evening)

- 110 **Cognitive and Perceptual Development (3)** Abravanel
Concepts and research in the area of developmental psychology; emphasis on the growth and development of perception, cognition, and language. (Spring—day)
- 112 **Psychology of Adolescence (3)** Johnson
Psychological characteristics and problems peculiar to adolescence, with emphasis on applications of psychology to solution of such problems. (Fall—day)
- 115 **Psychology of Language and Communication (3)** Mosél
Introduction to psycholinguistics and verbal behavior. Information theory, measurement of meaning, cultural and linguistic structures in the perception and learning of language. (Fall—day)
- 118 **Physiological Psychology (3)** Bull
Basic structure and functions of sensory systems, motor systems, central nervous system, autonomic nervous system, and endocrine system, with emphasis on the relations between physiological functioning and behavior. (Fall and spring—day)
- 121 **Psychology of Learning (3)** Bull
Current learning theories and issues. (Fall—day)
- 129 **Theories of Personality (3)** Kirkbride
(Formerly *Motivational Factors in Personality*)
Survey of personality theories; emphasis on their application to problems of individuals. (Fall—day)
- 131 **Psychological Tests (3)** Hunt, Karp
Survey of psychological tests and their more common uses in business, industry, government, law, medicine, and education. Material fee, \$7. (Fall—day; spring—evening)
- 144 **Personnel and Industrial Psychology (3)** Mosél
Psychological concepts and methods applied to problems of personnel management, human engineering, employee motivation, and productivity. (Spring—day)
- 145 **Psychology of Management (3)** Cohen
Primarily for students in the schools of Engineering and Applied Science and Government and Business Administration. Introduction to principles of industrial organizations and personnel selection. (Fall and spring—evening)
- 151 **Social Psychology (3)** Tuthill, White
Social foundations of attitudes and behavior: cognition, motivation, role-behavior, communication, small-group processes, racial attitudes, nationalism, and war. (Fall—evening; spring—day)
- 156 **Psychology of Attitudes and Public Opinion (3)** Tuthill
Psychology of opinion formation, measurement of opinion, social determinants of attitudes, psychological processes in propaganda, bases of receptivity to propaganda, psychological warfare. (Spring—evening)

- 161 Comparative Psychology (3)** Caldwell
Lectures and demonstrations on animal psychology. Psychological processes in infrahuman organisms, evolution of behavior, the place of animal experimentation and research in psychology. (Spring—day)
- 191 Independent Research in Psychology (3)** Staff
Opportunity for work on individual library or experimental projects. Open to qualified students by permission; arrangements must be made with the sponsoring faculty member prior to registration. May be repeated once for credit. (Fall and spring)
- 192 Field Experience in Psychology (3)** Abravanel
Selected senior psychology majors will spend a minimum of 6 hours a week in a local hospital, school, or community setting. Students registering for this course must have the approval of the Chairman of the Department by May 1 for the fall semester and by December 15 for the spring semester. (Fall and spring)
- 196 History and Systems of Psychology (3)** Caldwell and Staff
Senior capstone course which includes a survey and integration of the major viewpoints and concepts of psychology. Required of psychology majors. (Fall—day; spring—evening)
- 198 Current Research Issues in Psychology (3)** Staff
Conducted as a seminar. Recent experiments in psychology, including those performed by members of the class; emphasis on student participation. Limited to senior psychology majors. May be repeated for credit. (Spring—day)

THIRD GROUP

Third-group courses are limited to graduate students in Psychology, except by special permission of instructor and Chairman of the Department.

- 202 Psychological Research Methods and Procedures (3)** Walk, Abravanel
Required in all graduate Psychology programs. Prerequisite: a laboratory course in experimental psychology and an elementary course in statistics. (Spring—day)
- 203-4 Experimental Foundations of Psychology (3-3)** Bull
Required of doctoral students in Psychology during first year of study. Psyc 203: problems in physiologic processes, psychophysics, sensation, and perception. Psyc 204: motivation, learning, cognitive processes. (Academic year—day)
- 205 Research Methods in Intervention Programs (3)** Karp
Consideration of the special problems of conducting research in a clinical setting; emphasis on issues of content and method of studies designed to assess effects of therapeutic intervention. Prerequisite: Psyc 202. (Fall—day)
- 206 Methods of Clinical and Personality Research (3)** Rice
Review of techniques especially relevant to research in clinical, personality, and social psychology. Scaling methods, multivariate techniques, and an introduction to the use of computers in data analysis. Prerequisite: Psyc 202; Stat 105 or equivalent. (Spring—day)

- 207-8 **Psychological Assessment (3-3)** Holmstrom, Levy, Meltzer, Silber
Open only to graduate students in the Department of Psychology. Theoretical and clinical aspects of assessment; includes interviewing, psychometric tests, and projective techniques. Two-hour laboratory—diagnostic work at clinical facilities. Material fee, \$7 a semester. (Academic year—day)
- 211 **Assessment of Cognitive Functioning (3)** Karp
 Concepts of intelligence and achievement and their assessment through a variety of group and individual procedures. Emphasis on evaluation of children. Material fee, \$7. Admission by permission of instructor. (Fall—day)
- 212 **Personality Assessment by Projective Techniques (3)** Levy
 Methods of personality assessment, including psychometric and projective tests. Material fee, \$7. Admission by permission of instructor. (Spring—day)
- 213-14 **Seminar: Developmental Psychology (3-3)** Abravanel, Goodnow, Walk
 Psyc 213: research and theory in developmental psychology, emphasis on perceptual and cognitive development; consideration of the development of social awareness and of genetic-biological growth processes. Psyc 214: emphasis on current research and theory in perceptual and cognitive development, intensive study of selected research problems. (Academic year—day)
- 215 **Personality Assessment by Multiple Procedures (3)** Meltzer
 Consideration and use of a wide range of procedures in assessment of personality and psychopathology of children. Prerequisite: Psyc 207-8 or 211 and 212. Graduate students in fields other than Psychology admitted by permission of instructor. Material fee, \$7. (Fall—day)
- 218 **Seminar: Systems of Psychotherapy (3)** Silber
 Introduction to theory and technique of psychotherapeutic approaches: psychoanalytic, ego-centered, nondirective, transactional, and others. Original sources surveyed. (Spring—evening)
- 219 **Seminar: Topics in Advanced Clinical Psychology (3)** Margolin, Ives
 Selected areas of research and theory in the general field of clinical psychology. Community psychology and professional problems alternate. Independent topics each semester; may be repeated for credit. (Fall and spring—evening)
- 220 **Seminar: Abnormal Psychology (3)** Meltzer
 Study of selected problems in the field of abnormal psychology. (Fall and spring—day)
- 223 **Seminar: Learning (3)** Staff
 Selected topics in the psychology of learning. (Spring—evening)
- 226 **Seminar: Clinical Psychology of Childhood and Adolescence (3)** Johnson
 Survey of behavior and personality disorders. (Spring—evening)

- 227-28 **Seminar: Principles of Psychotherapy (3-3)** Kahn
(Formerly Seminar: Variations in Psychotherapeutic Approach)
 Patient needs and demands on the therapist. Case participation heavily relied upon. Open to qualified students in Psychology and related fields, with permission of instructor. Prerequisite: Psyc 218. May be repeated once for credit. (Academic year—day)
- 229 **Seminar: Principles of Behavior Change (3)** Phillips
 Stimulus-organism-response variables and their interactions, with emphasis on learning theory as applied to clinical problems. (Fall—day)
- 230 **Seminar: Operant Applications to Clinical Problems (3)** Sibley
 Examination of the broad role of reinforcement contingencies, behavior shaping, and other experimentally derived concepts as they apply to the management and control of a wide variety of human clinical problems. (Spring—day)
- 231 **Development of Psychometric Instruments (3)** Mosél
 Quantitative techniques and principles used in construction, standardization, and evaluation of personality and ability measures for research and practice; quantification of human judgment for measurement purposes. Prerequisite: course in tests and measurements and an elementary course in statistics. (Fall—evening)
- 234 **Seminar: Theory of Psychological Measurement (3)** Mosél
 Development of classical axiomatic-deductive theory underlying major notions in the construction and evaluation of psychological tests.
- 245 **Seminar: Organizational Behavior (3)** Mosél
 Analysis of organizational behavior; emphasis on motivation and productivity. Recent research on employee attitudes, primary group, effects of various patterns of supervisory leadership, role of formal and informal organization, job design. (Spring—evening)
- 246 **Seminar: Personnel Measurement Techniques (3)** Mosél
 Detailed consideration of techniques of personnel selection and performance evaluation. Employment tests, personal data, assessment interviews, and performance ratings.
- 251 **Seminar: Advanced Social Psychology (3)** Tuthill, White
 Current research and theory: motivation and cognition, dissonance, social interaction theory, authoritarianism, class differences, group dynamics, group conflict. (Fall—day)
- 252 **Research Methods in Social Psychology (3)** Tuthill
 Opinion and attitude survey techniques: interviewing, content analysis, report writing, etc. (Spring—evening)
- 254 **Seminar: Experimental Social Psychology (3)** Tuthill
 Experimental study of small groups, autocratic and democratic group climates, interaction process analysis, Lewin's field-theoretical approach to individual and group processes. (1971-72 and alternate years: spring—evening)

- 256 **Seminar: Psychological Causes of War (3)** White
(Formerly Seminar: Psychology of Group Conflict)
 An attempt to integrate evidence from animal behavior, child behavior, anthropology, psychiatry, and recent history, including World Wars I and II and the present East-West conflict. (Spring—day)
- 259 **Seminar: Social Psychology of Communism (3)** White
 Public and governmental opinion in communist countries, authoritarian thinking, communist propaganda, problems of Western communication with communist countries. (Fall—day)
- 261 **Seminar: International Communication (3)** Mosel
 Primarily for students in the schools of Government and Business Administration and Public and International Affairs. Communicating information and effecting attitude change across cultures by mass media. Emphasis on psychocultural factors and the functions of mass communication in the development of transitional societies. (Spring—evening)
- 269 **Seminar: Topics in Social Psychology (3)** Murphy
 Selected areas of research and theory in social psychology. Independent topics each semester; may be repeated for credit. (Fall—day)
- 272 **Seminar: Theories of Personality (3)** Caldwell
 Emphasis on theoretical problems and methodology in the field of personality study. (Fall—evening; spring—day)
- *280 **Vietnam: Causes and Prospects (3)** White, Gordon
 An interdisciplinary, area-centered approach, with primary stress on the causes of the war, but with attention also to the future of Southeast Asia as a whole. (Spring—day)
- 283-84 **Practicum in Clinical Psychology (3-3)** Silber
 Supervised practical instruction in agencies doing clinical psychological work. Prerequisite: Psyc 212. Admission by permission of instructor. (Academic year)
- 289 **Seminar: Current Topics in Experimental Psychology (3)** Staff
 Review and discussion of contemporary research and theory in a specialized field of psychological study, by leaders in the field. Independent topics each semester; may be repeated for credit. (Fall and spring—evening)
- 290 **Seminar: Special Problems in Personality Research (3)** Murphy
 Selected theoretically important and challenging contemporary research problems. May be repeated once for credit. (Fall and spring—day)
- 292 **Seminar: Perception (3)** Walk
 Study of current research and theory in the experimental psychology of perception. (1970-71 and alternate years: fall—day)
- 293 **Seminar: Psychology of Thinking (3)** Rice
 Thinking and problem solving. Specific topics include concept formation, nature of insight, and other cognitive processes. (1971-72 and alternate years: spring—day)

* An interdepartmental course offered by the departments of Psychology and Political Science.

- 295 **Independent Research in Psychology** (arr.) Staff
Individual library or experimental research under supervision of staff member. Arrangements must be made with sponsoring faculty member prior to registration. May be repeated once for credit. (Fall and spring)

- 299-300 **Thesis Research** (3-3) Staff
(Academic year)

FOURTH GROUP

- 398 **Advanced Reading and Research** (arr.) Staff
Limited to students preparing for the Doctor of Philosophy general examination. May be repeated for credit. (Fall and spring)

- 399 **Dissertation Research** (arr.) Staff
Limited to Doctor of Philosophy candidates. May be repeated for credit. (Fall and spring)

Public Administration

Professors D.S. Brown, Waldo Sommers, K.E. Stromsem, S.M. Rosen (*Visiting*), D.R. Cloutier (*Chairman*)
Professorial Lecturers W.G. Torpey, C.E. Goode, Ben Posner, C.L. Berg, R.R. Temple
Associate Professorial Lecturers Ross Pollock, Norman Beckman, L.B. Pouliot, W.E. McConville
Assistant Professor S.R. Chitwood

Programs of study in Public Administration leading to the degrees of *Master of Public Administration*, *Master of Arts in Government*, and *Doctor of Public Administration* are offered by the School of Government and Business Administration (see pages 127-52).

THIRD GROUP

- 213 **Administration in Government** (3) Cloutier
Critical analysis of federal administrative organizations as an integral part of the political system. Roles of Congress, the Presidency, the Courts, interest groups, political parties, and the public in the administrative process; special attention to centripetal and centrifugal forces. (Fall—day and evening; spring—evening)

- 215 **Comparative Administrative Systems** (3) Rosen
Examination and analysis of the administrative systems of selected foreign governments; attention to practices applicable to administration in the United States.

- 216 **Administration of International and Supranational Activities** (3) Staff
Analysis of the evolution and application of the administrative process in selected international and supranational activities. Problems of organization and management in multi-national supported and staffed activities.

- 217 **Seminar: Developmental Administration I (3)** Brown
National cultures and their relationships to administrative systems. Colonialism and its vestiges. The problems and deficiencies of administration in underdeveloped countries. (Fall—evening)
- 218 **Seminar: Developmental Administration II (3)** Brown
Problem of the transfer of administrative capability from one country to another. Political and administrative development. Unilateral and multi-lateral approaches. The role of the innovator. Strategies of administrative development. (Spring—evening)
- 221 **Management in the Executive Branch (3)** Rosen
Analysis of application of management theory and practice in the Executive Branch of the Federal Government; emphasis on staff responsibilities and relationships and internal organization and control. (Fall and spring—evening)
- 223 **Behavioral Factors in Large Organizations (3)** Brown
Analysis of the nature and characteristics of bureaucracy; dysfunctionality; approaches to policy guidance and leadership, particularly in large public organizations; influence and control systems. (Fall and spring—evening)
- 231 **Public Personnel Administration (3)** Sommers
Survey of basic principles and functions of personnel administration in the public service. Roles of personnel management, recruitment, placement, wage and salary administration, training, retirement, and other personnel functions. (Fall—evening)
- 232 **Problems in Public Personnel Management (3)** Sommers
Analysis and evaluation of major personnel management problems in government; employee-management relations; interagency and intergovernmental relationships. Impact of automation. Evaluation of personnel systems. (Spring—evening)
- 233 **Seminar: Manpower Development and Utilization (3)** Staff
Analysis of manpower resources. Research projects and case studies in ways and means of increasing employee potential; use of training programs, executive development, incentive systems. (Fall—evening)
- 235 **Technological Change and Manpower (3)** Staff
Research, discussion, and readings dealing with manpower problems arising from automation and other technological changes. Evaluation of these developments in government and business; their implications for productivity, employment, training and education, and personnel and industrial relations. Analysis of economic, political, and social factors influencing public and private industry manpower policies. (Spring—evening)
- *243 **Local Government Law (3)** Pock
Decision-making processes in metropolitan and local communities; types and objectives of city, county, and special function local government units; intergovernmental relations; original organization and changes; personnel;

* Same as Law 349 (2). Students electing P Ad 243 make special arrangements with instructor for supplementary assignments equivalent to one additional semester hour. Dr. Pock is Professor of Law in the National Law Center.

- local lawmaking; responsibility in tort; introduction to community planning. (Fall or spring)
- 246 **Urban Dynamics** (3) Beckman
Forces that lie behind economic decisions which in turn determine the development of cities. (Fall—evening)
- 248 **Financing Metropolitan Services** (3) Cloutier
Analysis of the structure and administration of public finance of local governments. (Spring—evening)
- 249 **Administration in Metropolitan Area Governments I** (3) Cloutier
Examination of public administration at the local level. Developments and trends growing out of the changing urban pattern. (Fall—evening)
- 250 **Administration in Metropolitan Area Governments II** (3) Cloutier
Examination of newly emerging political and social groups in metropolitan areas and their relations to governmental administration. Examination of federal programs in metropolitan areas. Prerequisite: P Ad 249 or permission of instructor. (Spring—evening)
- *251 **Governmental Budgeting** (3) Stromsem, Posner
Survey of the basic concepts, principles, and practices in governmental budgeting; interrelationship of planning, programming, and budgeting; their role in the management process. (Fall and spring—evening)
- 252 **Problems in Planning, Programming, and Budgeting** (3) Chitwood
Intensive analysis of developments in federal planning, programming, and budgeting; application of new tools in the decision-making process; evaluation of the systems. (Fall and spring—evening)
- 254 **Seminar: Financial Management in the Federal Service** (3) Stromsem
Functions and interrelationships of central federal financial management agencies, their policy, economic and managerial roles, controllership functions, and standards and practices in financial management. (Spring—evening)
- 260 **Seminar: Policy Formulation and Administration** (3) Rosen
Analysis in depth of factors and processes involved in policy development with particular attention to selected areas of national policy; development of agency goals and objectives. (Fall—evening)
- 261 **The Public and the Administrator** (3) Staff
Nature of the public interest, ways of determining public opinion, public opinion and the decision-making process, theories and methods of working with the public, interest groups, public relations and information programs.
- 262 **Seminar: Science, Technology, and Public Policy** (3) Rosen
The impact of science and technology upon public administration in terms of both administrative practice and national policies. (Spring—evening)
- 263 **Seminar: Regulation of Transportation I** (3) Hill
History of development of modes of transportation in the United States; economic problems and growth of regulatory legislation and philosophy; the Congressional power to regulate; the scope of federal regulation;

* Special sections of this course offered in the Navy Graduate Financial Management Program.

agency administration, enforcement, and procedure; introduction to principles of certification and rate making. (Same as Law 407 (2)).* (Fall or spring)

264 Seminar: Regulation of Transportation II (3) Hill

Principles of certification of rail, motor, water, and air carriers; elements and principles of rate making; comparison of problems, procedures, and regulatory philosophies of the various regulatory agencies. (Same as Law 408 (2)).* (Spring)

271 Readings and Research in Public Administration (3) Chitwood

Advanced directed readings and research in specific areas of public administration. (Fall and spring)

273 Colloquium: Public Administration and American Political and Social Institutions (3) Cloutier

Supervised study in depth of contemporary literature in selected fields, and of research methodology in public administration. Primarily for doctoral candidates. (Fall)

298 Case Studies in Public Administration (3) Rosen

Analysis and discussion of problems in public management by use of the case method. (Spring—evening)

299 Thesis Seminar (3) Sommers

Examination of thesis standards, research philosophy and methodology. (Fall and spring—evening)

300 Thesis Research (3) Staff

(Fall and spring)

FOURTH GROUP

398 Advanced Reading and Research (arr.) Staff

Limited to students preparing for the Doctor of Public Administration general examination. May be repeated for credit. (Fall and spring)

399 Dissertation Research (arr.) Staff

Limited to Doctor of Public Administration candidates. May be repeated for credit. (Fall and spring)

Public and International Affairs†

Professors A.E. Burns, J.W. Brewer, H.M. Merriman, D.S. Watson, R.H. Davison, W.H. Kraus, R.B. Thompson, J.W. Kendrick, C.T. Stewart, Jr., H.L. LeBlanc, C.E. Galbreath, H.M. Stout, J.N. Mosel, W.C. Hopkins, F.H. Michael, R.E. Purcell, Joseph Aschheim, R.K. White, Benjamin Nimer, Helen Yakobson, R.P. Sharkey, Andrew Gyorgy, Mario Rodríguez, C.B. Sargent,

* Students registering for P Ad 263 or 264 make special arrangements with instructor for supplementary assignments equivalent to one additional semester hour. Mr. Hill is Professorial Lecturer in Law in the National Law Center.

† Programs in Chinese Studies, International Affairs, Public Affairs, and Russian Studies are administered by the School of Public and International Affairs, B.M. Sapin, Dean.

George Stambuk, H.C. Hinton, H.M. Sachar, Vladimir Petrov, B.M. Sapin, F.T. Peck (*Visiting*), Kurt Wilk (*Visiting*)
Professorial Lecturers Bela Maday, Joseph Baclawski, John Hardt, Tao-tai Hsia, Matthew Gallagher, F.L. Hadsel, L.C. Tihany, Bernard Gordon, Roman Kolkowicz, Bernard Ramundo, Lothar Metz
Associate Professors P.P. Hill, Ching-Yao Hsieh, W.R. Johnson, Sidney Ploss (*Research*), Chung-wen Shih, J.K. McDonald, J.A. Morgan, Jr., C.F. Elliott, R.Y.C. Yin, C.A. Moser, Bernard Reich, Richard Thornton, R.M. Dunn, Jr.
Adjunct Associate Professor Donald Robinson
Associate Professorial Lecturers Philip True, Robert Ellert, John Hanessian, Jr., C.A. Linden
Assistant Professors D.T. Allensworth, G.C.Y. Wang, Anita Dasbach, D.L. Lee, S.J. Wayne, J.M. Logsdon
Assistant Professorial Lecturer Ming-jean Loh
Instructor K.L. Storrs

Bachelor of Arts in the field of Chinese Studies.—Prerequisite: the Chinese Studies curriculum, page 82, including Chin 5–6.

The general requirements are stated on pages 155–57. The 60 semester hours must include courses as described in I and II below.

I. Twenty-four semester hours of course work distributed as follows: (a) Chin 7 and 165 or 167; (b) Econ 169; (c) 6 hours selected from Hist 138, 187, 188, 195–96; (d) 6 hours selected from P Sc 101, 193, 194.

II. Thirty-six semester hours chosen from (a), (b), or (c) below:

(a) Economics concentration—27 semester hours of approved Economics courses (including a 6-hour research and writing seminar) and 9 semester hours of electives selected from courses other than Economics, or

(b) History concentration—21 semester hours of approved History courses (including a 6-hour research and writing seminar) and 15 semester hours of electives selected from courses other than History, or

(c) Political Science concentration—24 semester hours of approved Political Science courses (including a 6-hour research and writing seminar) and 12 semester hours of electives selected from courses other than Political Science.

Bachelor of Arts in the field of International Affairs.—Prerequisite: the International Affairs curriculum, page 82.

The general requirements are stated on pages 155–57, 158. The 60 required semester hours must include (1) Econ 181–82; 6 semester hours of foreign language composition and conversation; Hist 157, 182; P Sc 171, 181–82, 197; (2) 15 semester hours of electives; (3) 15 semester hours from one of the Group Options listed below:

Group I. International Politics—courses selected from Geog 125, 126, 127, 146; Hist 138, 139–40, 149, 183, 184; P Sc 107, 111, 112, 113, 117–18, 160, 167, 172, 196.

Group II. International Economics—courses selected from B Ad 175, 176, 177, 178; Econ 101, 102, 104, 121, 122, 134, 147; Geog 125, 126, 127, 132, 134; Stat 111, 112, 122.

Group III. International Communications—courses selected from Anth 150, 153, 157, 161, 162; Geog 125; Jour 145, 146; P Sc 146, 167; Psyc 115, 151, 156; Soc 144.

Group IV. Regional Study with a concentration in one of the following areas: (1) Africa—courses selected from Anth 178, 179, Geog 155, P Sc 189, 190, 192, 196; (2) Europe—courses selected from Econ 147, Geog 153, Hist 131–32, 141–42, 147, 149, 151–52, 158, 162, P Sc 111, 112, 113, 117–18; (3) Far East—courses selected from Anth 173, 174, 175, Chin 165, 167, Econ 169, Geog 165, Hist 187, 188, 195–96, P Sc 101, 193, 194, 196; (4) Latin America—courses selected from Anth 170, 172, Econ 185–86, Geog 161, Hist 162, 163–64, 165, 166, P Sc 177, 178, interdisciplinary seminar 287 offered by six departments participating in the Latin Ameri-

can Studies program; (5) Middle East—courses selected from Anth 177, Hist 149, 158, 193, 194, P Sc 191, 192, 196; or (6) Soviet Orbit—courses selected from Econ 133, 134, Geog 166, Hist 138, 145-46, 188, P Sc 112, 115, 160, 161, 163, Slav 161-62, 165, 166, 194.

Bachelor of Arts in the field of Public Affairs.—Prerequisite: the Public Affairs curriculum, page 82.

The general requirements are stated on pages 155-57, 158. The 60 required semester hours must include (1) Econ 102, 121, 161, 162; Hist 175-76; P Sc 121-22, 145, 151; (2) 18 semester hours of electives; (3) 12 semester hours from one of the Group Options listed below:

Group I. Economics—Econ 101, 104, 165, 181.

Group II. Politics—P Sc 103 or 104, 111, 119, 126.

Group III. Urban Affairs—to be selected from B Ad 174; Econ 157; Educ 123; Geog 141; P Sc 103-4; Psyc 151; Soc 126.

Certificate of the Institute for Sino-Soviet Studies.—Prerequisite: a Bachelor's degree from an accredited college or university with an undergraduate major in a pertinent field, with emphasis on communist affairs.

The general requirements are stated on page 165. The program consists of 30 semester hours of graduate study and the passing of a reading examination in Russian or Chinese, or both.

Master of Arts in the field of International Affairs.—Prerequisite: a Bachelor's degree from an accredited college or university with background courses corresponding to an undergraduate major in International Affairs at this University.

Required: in addition to the general requirements, pages 158-61, the following specific requirements must be met: (1) a scheduling of graduate courses amounting to 24 semester hours, planned in consultation with the adviser on the basis of the student's selection from the following general, supplementary, and regional studies—(a) International Politics, Comparative Government and Politics, Modern Political Theory (including Socialist and Communist Theory), and International Economics; (b) International Law, International Organization and Administration, International Economic Development, International Communications, International and Comparative Aspects of Communism, U.S. Diplomatic History, and U.S. Foreign Policy; (c) modern history, or government and politics, or economic history and problems of Western Europe, Eastern Europe, Soviet Union, Latin America, Middle East, Africa, South and Southeast Asia, and China; (2) P Sc 299-300 *Thesis Research* (3-3); and (3) a set of written examinations over three fields within the broad area of international affairs (the fields must represent at least two disciplines and include at least one general field).

Master of Arts in the field of Public Affairs.—Prerequisite: a Bachelor's degree from an accredited college or university with an undergraduate major in public affairs, economics, history, or political science, depending upon the field of specialization in the Master's program.

Required: the general requirements, pages 158-60, 162. The 24 semester hours of required courses (exclusive of P Sc 299-300) are to be selected from one of the following fields of specialization: Domestic Economics (courses in economic development, economic policy, public finance, and national income); Domestic Politics (courses in U.S. social, constitutional, and political history; comparative government; political theory; the American Presidency; legislative organization; jurisprudence; political parties; and public opinion).

Master of Arts in the field of Russian Studies.—Prerequisite: a Bachelor's degree from an accredited college or university with an undergraduate major in a pertinent field. The undergraduate program should have included the following courses, or equivalent: Hist 145-46; P Sc 112 or 161; Slav 1-2 and 3-4, or 5 and 6.

Required: the general requirements, pages 158-60, 162, including Econ 133; Hist 237, 245; P Sc 224, 229, 269; Slav 161-62 or 165 and 166; and *Thesis Research* (299-300). With the exception of *Thesis Research*, students may, with the approval

of the adviser, substitute alternate courses. The thesis should be interdisciplinary in approach.

Master of Science in International Affairs.—Offered in cooperation with the College of General Studies in the off-campus programs at the National War College, Fort McNair, Washington, D.C., and the Naval War College, Newport, R.I.

Religion

Professor R.G. Jones (Chairman)

Associate Professors H.E. Yeide, Jr., Dewey Wallace, Jr.

Assistant Professors Sonya Quitslund, A.J. Hildebeitel

Assistant Professorial Lecturer M.S. Halpern

Bachelor of Arts with a major in Religion (Field-of-Study).—Prerequisite: the Arts and Letters curriculum, page 78, including Rel 9, 10, and 59–60.

Required: the general requirements, pages 83–87, and the passing of the Religion major examination at the end of the senior year. The coordinated field of knowledge upon which the student will be examined includes the history and literature of the world's religions and the philosophical and ethical problems of religious thought. A student may elect to give special emphasis in his program to Christianity, Judaism, or the religions of India. A proseminar (Rel 199–200) assists the student in preparing for the major examination. A pamphlet containing a detailed description of the major is available in the offices of the Dean of Columbian College of Arts and Sciences and the Chairman of the Department of Religion.

Master of Arts in the field of Religion.—Prerequisite: an undergraduate major in Religion at this University, or equivalent.

Required: the general requirements, pages 91–97. Of the 24 semester hours of required courses (exclusive of the thesis) at least 12 must be in third-group Religion courses; a maximum of 9 may be in a closely related field outside the Department of Religion as approved by the Department.

Master of Arts in the field of Religious Education.—Prerequisite: an undergraduate major in Religion at this University, or equivalent; the following specific courses or equivalent: Educ 108; Psyc 1, 22, and 29; Anth 1; Sp&D 1 or 11.

Required: the general requirements, pages 91–97. Of the 24 semester hours of required courses (exclusive of the thesis), at least 6 must be in third-group Religion courses; a maximum of 12 may be in a closely related field outside the Department of Religion as approved by the Department.

Doctor of Philosophy in the field of American Religious History (offered in cooperation with the Department of History).—See pages 91–95, 97–99, for requirements for the degree.

FIRST GROUP

9 The Old Testament (3)

Jones, Quitslund

Historical and literary study of the Old Testament with consideration of development of religious ideas, institutions, and outstanding personalities. (Fall—day and evening)

10 The New Testament (3)

Jones

Study of New Testament literature from the standpoint of occasion, purpose, dominant ideas, and permanent values. Emphasis on approach, structure, and significance of the Gospels and Epistles. (Spring—day and evening)

21 Introduction to Religious Thought (3)

Yeide

Traditional religious concepts, language of contemporary religion amidst modern scientific and secular intellectual tendencies, and the place of religion in today's society. (Fall and spring—day)

59-60 History of Religions (3-3)

Wallace, Hildebeitel

Origins, evolution, and contemporary status in historical context. Rel 59: primitive religion and the religions of the East (Hinduism, Buddhism, Taoism, Confucianism, Shinto). Rel 60: religions of the West and Near East (ancient religions, Judaism, Christianity, Islam). (Rel 59: fall—day and evening; spring—day. Rel 60: fall—day; spring—day and evening.)

SECOND GROUP**103 The Prophets (3)**

Quitslund

Development of prophetism in the Old Testament; cultural, economic, psychological, and religious factors; elements of lasting value in the prophetic teaching. Study of selected prophets. (Fall—day)

104 The Life and Thought of Jesus (3)

Quitslund

Comprehensive study of the life and teachings of Jesus with critical attention to sources. (Spring—day)

105 The Life and Thought of Paul (3)

Backgrounds of early Christianity, first-century religious and social conditions affecting the spread of Christianity, the life and journeys of Paul, Paul's presentation of the Christian faith.

121 Philosophical Problems of Western Religious Thought (3)

Classical and contemporary religious thinkers with reference to the nature of religious truth and experience; the existence, character, and activity of God; and the predicament of man.

122 Christian Ethics and Modern Society (3)

Yeide

Nature and principles of Christian life as developed by the Christian community; problems of personal conduct; application to family, social, and economic institutions. (Spring—day)

127 Medicine, Religion, and Healing (1)

Staff

Primarily for second-year students in the School of Medicine; open to Religion majors with the approval of the instructor. Introduction to the Total Care concept emphasizing the importance of religion in medical practice for patient and physician. Concept of the professional man, the clergy's role in healing, Jewish and Christian faiths and their attitudes in problem areas. Case studies. (Spring—day)

131 History of Christianity to the Reformation (3)

Rise and expansion of Christianity, development of Christian thought, and evolution of church organization and worship.

132 History of Modern Christianity (3)

Origin and development of Protestantism; Roman Catholic revival; status of Eastern churches; doctrines, worship, expansion, church and state, and relation to modern thought and life.

- 135 History of Judaism to the Talmud (3)** Halpern
History and religious thought of the Jewish people from the Maccabean revolt to the compilation of the Talmud. (Fall—day)
- 136 History of Medieval and Modern Judaism (3)** Halpern
History and religious thought of the Jewish people from the compilation of the Talmud to the present. (Spring—day)
- 141-42 Religious Education (3-3)**
Religious education in the home, church, and community; basic educational procedures and special techniques; organization and administration of religious education.
- 159 Hinduism (3)** Hiltebeitel
Emergence of the structures of Hindu life and thought out of ancient Vedic religion, religious philosophy, role of Hinduism in Indian civilization. (Fall—evening)
- 160 Buddhism (3)** Hiltebeitel
Origin, development, and contemporary status of Buddhist life and thought; its impact on Asian civilization. (Spring—evening)
- 172 Religion in American Culture (3)** Wallace
Growth of religious bodies and institutions in relation to American culture, development of religious thought, and analysis of the contemporary religious scene. (Fall—day)
- 199-200 Proseminar: Readings for the Major (3-3)** Staff
Readings and group discussions. (Academic year)
- THIRD GROUP**
- 209-10 Seminar: Biblical Literature (3-3)**
Main problems of Biblical literary and historical criticism.
- 211-12 Seminar: Biblical Thought (3-3)** Jones
Biblical interpretation of history and reality and its relation to Biblical beliefs about God, man, and the world. (Academic year—evening)
- 222 Seminar: Christian Ethics (3)**
Important tendencies in ethical reflection of the contemporary Christian Church; contributions of social sciences to that reflection.
- 231-32 Seminar: Early and Medieval Christianity (3-3)**
Christian thought from primitive beginnings to the Reformation.
- 233-34 Seminar: Reformation and Modern Christianity (3-3)**
Western religious thought from the 16th century to the present.
- 241-42 Seminar: Religious Education (3-3)**
Major problems in the practice of religious education.
- 271 Seminar: American Religious History to 1830 (3)**
Religious thought and life during the Colonial and early National period.

273 Seminar: American Religious History since 1830 (3)

Wallace

Religious thought and life from the antislavery movement to the present.
(Fall—evening)

291-92 Readings and Research (3-3)

Staff

Investigation of special problems. (Academic year)

299-300 Thesis Research (3-3)

(Academic year)

Romance Languages and Literatures

Professors Rafael Supervía, J.W. Robb, G.E. Mazzeo

Associate Professors J.A. Frey, J.L. Métivier, Jr., J.F. Burks (*Chairman*),
Mary Ann Coffland, J.D. Vedvik

Assistant Professors Elizabeth Neyman, G.P. Huvé, Julia Hicks, Dorothy Betz,
Charles Mudge

Assistant Professorial Lecturers Esther Lawton, Mary Poole

Instructor Anne-Marie Schmutz

Director of Language Laboratories W.M. Kincaide

Bachelor of Arts with majors in (1) *French Language and Literature*, (2) *Spanish American Literature*, and (3) *Spanish Language and Literature (Field-of-Study)*.—
Prerequisite: the Arts and Letters curriculum, page 78.

Required: the general requirements, pages 83-87, and the passing of the major examination at the end of the senior year. The coordinated field of knowledge upon which the student will be examined includes the political, social, and cultural backgrounds of the literature studied; the writers and their works. Proficiency in the spoken and written language is required. Majors in Romance Languages are strongly advised to study Latin, a knowledge of which is generally required for graduate work. A proseminar in each of the major fields assists the student in his preparation for the major examination.

Master of Arts in the fields of (1) *French Language and Literature*, (2) *Spanish American Literature*, and (3) *Spanish Language and Literature*.—Prerequisite: the degree of Bachelor of Arts in the appropriate field from this University, or equivalent.

Required: the general requirements, pages 91-97. The 30 semester hours of required work must include a thesis (6 semester hours). The remainder of the program is arranged in consultation with the student's major adviser.

Doctor of Philosophy fields of study in Romance Languages and Literatures: (1) *French Literature (Old and Middle, Renaissance, 17th Century, 18th Century, 19th Century, Modern)*; (2) *Spanish Literature (Old, Medieval, Literature of the Siglo de Oro, 18th Century, 19th Century, Contemporary)*; (3) *Spanish American Literature*; and (4) *Philology*.—See pages 91-95, 97-99 for requirements for the degree.

Bachelor of Arts in Education with teaching fields in French and in Spanish.—
Prerequisite: the Education curriculum, page 80.

Required: the French option or the Spanish option and the professional courses listed on pages 109, 114, 115-16.

Placement Examination: A standardized placement examination given before registration is required of all entering students who wish to continue in college the language begun in high school. Upon completion of the examination, assignment is made to the appropriate course, with credit assigned on the usual basis.

FRENCH

Departmental prerequisite: Fren 3-4 or 6, or equivalent, is required (Fren 51-52 is recommended) as prerequisite to all second-group courses in French.

FIRST GROUP**1-2 First-year French (3-3)**

Mudge and Staff

A year course; credit toward a degree at this University given on completion of Fren 2. For beginners. Pronunciation, conversation, grammar, composition, reading of modern French prose. Aural training, oral practice in language laboratory. Laboratory fee, \$17.50 a semester. (Fren 1 and 2: fall and spring—day and evening)

2x First-year French (3)

Betz and Staff

Intensive course to which are assigned entering students with one or more years of high school French whose placement tests show them inadequately prepared for the regular work of Fren 3. Meets 6 hours a week (3 hours of lecture, 2 hours of drill, 1 hour of laboratory) and carries 3 semester hours of credit. Fee \$229 (tuition fee of \$204 plus additional fee of \$25) plus laboratory fee, \$17.50. (Fall—day and evening)

3-4 Second-year French (3-3)

Vedvik and Staff

A year course; credit toward a degree at this University given on completion of Fren 4. Conversation, grammar, composition, reading in modern French prose, introduction to French civilization. Aural training, oral practice in language laboratory. Prerequisite: Fren 1-2, 2x, or two years of high school French. Laboratory fee, \$17.50 a semester. (Fren 3 and 4: fall and spring—day and evening)

6 Second-year French (6)

Vedvik and Staff

Lecture (3 hours), discussion (3 hours). Intensive course which covers material of Fren 3-4. Grammar review, reading, conversation. Prerequisite: two years of high school French with grades of B or better; Fren 2 or 2x. (Spring—day)

9-10 French Conversation and Composition (3-3)

Huvé and Staff

Prerequisite: Fren 4 or equivalent and permission of instructor. (Fren 9: fall—day and evening; spring—day. Fren 10: fall—day; spring—day and evening.)

12 French Conversation and Composition (Intensive) (6)

Huvé and Staff

Intensive course which covers material of Fren 9-10. Laboratory fee, \$25.

49 French for Graduate Students (0)

Lawton and Staff

For graduate students preparing for reading examinations. No academic credit. Tuition fee, \$204. (Fall and spring—evening)

51-52 Survey of French Literature (3-3)

Métivier and Staff

Readings in French literature from the Middle Ages to the present. Lectures, readings, recitations, and informal discussions. (Fren 51: fall—day; spring—evening. Fren 52: fall—evening; spring—day.)

91-92 **Analyse de texte** (3-3)

Burks and Staff

Methodology and vocabulary of literary criticism; application of principles of *explication de texte* to selections from prose, drama, and poetry from the Renaissance to the present. (Academic year—day)

SECOND GROUP103 **Pronunciation and Intonation** (3)

Huvé

Recommended for majors. (Fall and spring—day)

108 **Cours avance de grammaire** (3)

Mudge

(Spring—day)

109-10 **Advanced French Conversation and Composition** (3-3)

Huvé

Fren 109: emphasis on diction. Fren 110: emphasis on style. Prerequisite: Fren 10 or equivalent and permission of instructor. (Academic year—day)

119-20 **French Literature of the Middle Ages and the Renaissance** (3-3)

Métivier

Literary history and the development of ideas. *Les chansons de geste*, courtly literature, satire, the theater, lyric and didactic poetry; Rabelais, Montaigne, La Pléiade. Class analysis of texts, collateral readings.

121-22 **17th Century French Literature** (3-3)

Vedvik

History, philosophy, criticism, memoirs, letters, eloquence, drama, fiction, poetry. Class analysis of texts; collateral readings. (Academic year—day)

123-24 **18th Century French Literature** (3-3)

Schmutz

History, philosophy, criticism, letters, drama, fiction, poetry, the "salons," idea of progress, idea of science. Class analysis of texts, collateral reading.

125-26 **19th Century French Literature** (3-3)

Betz, Frey

Poetry, drama, and novel of the 19th century with emphasis on stylistic analysis. (Academic year—day)

127-28 **20th Century French Literature** (3-3)

Coffland

Fiction, poetry, and drama from 1900 to present. Chronological examination of authors, movements. (Academic year—evening)

129-30 **Contemporary French Literature** (3-3)

Staff

193 **Cours de style** (3)

Advanced grammar, composition, and stylistics. Open to both advanced undergraduate and graduate students. Recommended for majors and teachers of French.

Staff

199-200 **Proseminar: Readings for the Major** (3-3)

Conferences and group discussions. (Academic year—day)

THIRD GROUP

- 202 **Thème et Version** (3) Schmutz
 Limited to students in the Graduate School of Arts and Sciences; open to others only by permission of the graduate adviser. Required of all graduate students in the field of French Language and Literature. Analysis and translation of selected prose passages, alternating between French and English; designed to teach students to write with precision and clarity. (Fall—day)
- 212 **Historical French Grammar** (3) Mudge
 Phonology, morphology, and syntax of Old French; its development from Vulgar Latin. Prerequisite: a second-group course in French literature. Knowledge of Latin useful. (Fall—day)
- 213–14 **Medieval French Literature** (3–3) Mudge
(Formerly Old French Literature)
 French literature to the end of the Middle Ages. Prerequisite: a second-group course in French literature.
- 224 **Seminar: the Age of Rabelais** (3) Burks
- 226 **16th and 17th Century Philosophical Literature** (3) Burks
 The emergence of a literature of ideas; emphasis on the thought of Calvin, Montaigne, Descartes, and Pascal.
- 228 **Seminar: the Literary Renaissance in Europe** (3) Burks
 Study of developments in the poetry of Italy, France, and England. (Fall—day)
- 231–32 **Theater in the 17th Century** (3–3) Vedvik
 Survey of the development of theatrical arts and the drama. Research papers and reports. (Academic year—day)
- 234 **17th Century Nondramatic Literature** (3) Vedvik
 Rationalism and the revolt against authority expressed in literature. Impact of nondramatic literature on the development of classical doctrine.
- 241 **The Rationalistic Current in the 18th Century** (3)
 The contribution of the *philosophes* to the intellectual evolution of France and Europe.
- 242 **Seminar: the French Novel in the 18th Century** (3) Staff
 (Spring—day)
- 244 **Special Problems in 18th Century French Literature** (3)
- 250 **Romanticism in France** (3) Frey
 (Fall—day)
- 256 **19th Century French Literature** (3) Frey
- 257 **Special Problems in the 19th Century Novel** (3) Frey
 Topic for 1970–71: Balzac. (Spring—day)
- 258 **Special Problems in 19th Century French Poetry** (3) Betz
 Topic for 1970–71: Parnassian poetry. (Spring—day)

264 Seminar: Modern Period (3)

Coffland

Topic for 1970-71: Proust. (Spring—day)

265 20th Century French Theater (3)

Coffland

266 20th Century French Poetry (3)

Coffland

Background and development of poetry in the 20th century; *explication de texte* approach. (Fall—day)**295 Independent Reading and Research in French Literature (arr.)**

For students preparing for the Master of Arts degree. May be repeated for credit. (Fall and spring)

299-300 Thesis Research (3-3)

Staff

(Academic year)

FOURTH GROUP**398 Advanced Reading and Research (arr.)**

Staff

Limited to students preparing for the Doctor of Philosophy general examination. May be repeated for credit. (Fall and spring)

399 Dissertation Research (arr.)

Staff

Limited to Doctor of Philosophy candidates. May be repeated for credit. (Fall and spring)

ITALIAN**FIRST GROUP****1-2 First-year Italian (3-3)**

Coffland and Staff

A year course: credit toward a degree at this University given on completion of Ital 2. For beginners. Pronunciation, conversation, grammar, composition, reading of modern Italian prose. Aural training, oral practice in language laboratory. Laboratory fee, \$17.50 a semester. (Academic year—day)

3-4 Second-year Italian (3-3)

Coffland and Staff

A year course: credit toward a degree at this University given on completion of Ital 4. Conversation, grammar, composition, reading in modern Italian prose, introduction to Italian civilization. Aural training, oral practice in language laboratory. Prerequisite: Ital 1-2 or two years of high school Italian. Laboratory fee, \$17.50 a semester. (Academic year—day)

9-10 Italian Conversation and Composition (3-3)

(Aca-

Prerequisite: Ital 4 or equivalent and permission of instructor. (Academic year—day)

51-52 Introduction to Italian Literature (3-3)

Prerequisite: Ital 4 or equivalent. (Academic year—day)

THIRD GROUP

295 Independent Reading and Research in Italian Literature (arr.)

For students preparing for the Master of Arts or Doctor of Philosophy degree. May be repeated for credit. (Fall and spring)

SPANISH

Departmental prerequisite: Span 3-4 or 6, or equivalent, is required (Span 51-52 is recommended) as prerequisite to all second-group courses in Spanish.

FIRST GROUP

1-2 First-year Spanish (3-3)

Hicks and Staff

A year course: credit toward a degree at this University given on completion of Span 2. For beginners. Pronunciation, conversation, grammar, composition, reading of modern Spanish prose. Aural training, oral practice in language laboratory. Laboratory fee, \$17.50 a semester. (Span 1 and 2: fall and spring—day and evening)

2x First-year Spanish (3)

Neyman and Staff

Intensive course to which are assigned entering students with one or more years of high school Spanish whose placement tests show them inadequately prepared for the regular work of Span 3. Meets 6 hours a week (3 hours of lecture, 2 hours of drill, 1 hour of laboratory) and carries 3 semester hours of credit. Fee, \$229 (tuition fee of \$204 plus additional fee of \$25) plus laboratory fee, \$17.50. (Fall—day)

3-4 Second-year Spanish (3-3)

Neyman and Staff

A year course: credit toward a degree at this University given on completion of Span 4. Conversation, grammar, composition, reading of modern Spanish prose, introduction to Hispanic civilization. Aural training, oral practice in language laboratory. Prerequisite: Span 1-2, 2x, or two years of high school Spanish. Laboratory fee, \$17.50 a semester. (Span 3 and 4: fall and spring—day and evening)

6 Second-year Spanish (6)

Neyman

Lecture (3 hours), discussion (3 hours). Intensive, accelerated course which covers material of Span 3-4. Grammar review, reading, conversation. Prerequisite: two years of high school Spanish with grades of B or better, or grades of Honors or High pass in Span 2 or 2x. (Spring—day)

9-10 Spanish Conversation and Composition (3-3)

Hicks and Staff

Prerequisite: Span 4 or equivalent and permission of instructor. (Span 9 and 10: fall and spring—day)

12 Spanish Conversation and Composition (Intensive) (6)

Staff

Intensive, accelerated course which covers the material of Span 9-10. Laboratory fee, \$25.

49 Spanish for Graduate Students (0)

Hicks

For graduate students preparing for reading examinations. No academic credit. Tuition fee, \$204. (Fall and spring—evenings)

- 51-52 **Survey of Spanish Literature and Civilization (3-3)** Supervia
 Social, artistic, and cultural background of Spanish literature. Lectures, readings, recitations, and informal discussions. (Academic year—day)
- 91-92 **Explicación de textos (3-3)** Staff
 Analytical introduction to Spanish and Spanish American literature. Method demonstrated and practiced on selected passages. (Academic year—day)

SECOND GROUP

- 103 **Pronunciation and Intonation (3)** Staff
 Descriptive and practical review of Spanish sounds and inflections. Remedial exercises. Recommended for majors; required for the Bachelor of Arts in Education degree with teaching field in Spanish (Fall—day)
- 109-10 **Advanced Spanish Conversation and Composition (3-3)** Mazzeo
 Emphasis on diction and style. Prerequisite: Span 10 or equivalent and permission of instructor. (Academic year—day)
- 119-20 **Medieval Spanish Literature (3-3)** Neyman
 Survey by genre of the literature of the Middle Ages. (Academic year—day)
- 121-22 **Spanish Literature of the Golden Age (3-3)** Staff
 Span 121: development of the Spanish drama from its origins to 1680, emphasis on Lope de Vega; the evolution of Spanish poetry. Span 122: origins and development of the novel in the Golden Age, emphasis on the picaresque.
- 123-24 **Cervantes: Don Quijote (3-3)** Staff
 Cervantes' literary theories as reflected in the *Novelas Ejemplares* and the *Quijote*. The *Quijote* as a panorama of the social, political, and religious problems in the Spain of Cervantes. (Academic year—day)
- 125-26 **Modern Spanish Literature (3-3)** Mazzeo
 Prose, poetry, and drama of the 18th and 19th centuries. Class analysis of texts, collateral reading, lectures on literature and history. (Academic year—day)
- 127-28 **Contemporary Spanish Literature (3-3)** Supervia
 Prose and poetry of the 20th century. Class analysis of texts, collateral reading, lectures on literature and history.
- 129 **The Romantic Drama in Spain (3)** Mazzeo
 Lectures on the Spanish Romantic Drama, class analysis of representative plays, collateral readings.
- 130 **The Modern Spanish Essay (3)** Mazzeo
 Development of the Spanish essay from the 16th century; emphasis on the 18th and 19th centuries. Class analysis of texts, collateral reading, and lectures.

- 131 **The Generation of 1898** (3) Supervía
Study of the various critical problems related to this renaissance of Spanish letters as a whole, and of its most representative figures and works.
- 141 **Introduction to Spanish American Literature** (6)
Highlights of Spanish American literature through the colonial and modern periods. Given in English, with readings in Spanish. Of special interest to majors in Latin American Studies.
- 145 **Panoramic Vision of Mexico** (3)
A panoramic vision of Mexico in its cultural, educational, scientific, political, and social aspects.
- 151-52 **The Spanish American Novel** (3-3) Robb
Development of the novel in Spanish America. Lectures, collateral reading, and class analysis of texts.
- 155-56 **Spanish American Literature to 1880** (3-3) Robb
Literature of Spanish America from the colonial period to the latter part of the 19th century. Lectures, collateral reading, reports, and class analysis of important works.
- 157-58 **Spanish American Literature since 1880** (3-3) Robb
Literature of Spanish America from 1880 to the contemporary period. Lectures, collateral reading, reports, and class analysis of important works. (Academic year—evening)
- 193 **Curso de estilo** (3) Staff
Advanced grammar, composition, and stylistics. Open to both advanced undergraduate and graduate students. Recommended for majors and teachers of Spanish.
- 197-98 **Proseminar: Readings for the Major in Spanish American Literature** (3-3) Robb
Recommended for all majors. Conferences and group discussions. (Academic year)
- 199-200 **Proseminar: Readings for the Major in Spanish Language and Literature** (3-3) Mazzeo
Recommended for all majors. Conferences and group discussions. (Academic year—day)
- THIRD GROUP**
- 215-16 **Old Spanish** (3-3) Neyman
Span 215: phonetics, literature. Span 216: morphology, literature. (Academic year—day)
- 221 **Seminar: Cervantes' Don Quijote** (3) Staff
(Fall—day)
- 223 **Seminar: "La Celestina"** (3) Staff
- 224 **Seminar: Problems in Spanish Renaissance Literature** (3) Staff
(Spring—day)

- 225 Seminar: Special Problems in Golden Age Literature (3) Staff
- 231 Seminar: 18th Century Spanish Writers (3) Mazzeo
Lectures and analysis of principal authors and works; relationships with subsequent literary movements.
- 242 Seminar: Spanish Romanticism (3) Mazzeo
Lectures and analysis of principal authors and works. Collateral readings. Problems of origins and developments.
- 244 Seminar: Naturalism and the Spanish Novel (3) Mazzeo
Development of Naturalism in 19th century Spain. Analysis of representative works of Pardo Bazán, Clarín, Blasco-Ibáñez, and others. (Fall—day)
- 245–46 Seminar: Works of Galdós (3–3) Supervía
Ideological and stylistic analysis: relationship of his works to literary movements of the second half of the 19th century. (Academic year—day)
- 251 Seminar: Works of Unamuno and Ortega y Gasset (3) Supervía
Study of their thought; analysis and commentary on the texts.
- 252 Spanish Literature since the Civil War (3) (Fall)
- 253 Seminar: Studies in Modern Spanish American Poetry (3) Robb
- 255 Seminar: Studies in 20th Century Spanish American Theater (3) Robb
- 256 Seminar: Studies in Mexican Narrative Prose (3) Robb
- 261 Seminar: Studies in Spanish American Essayists (3) Robb
The Spanish American essay as an artistic form; selected modern essayists. (Fall—day)
- 264 Seminar: Studies in Recent Spanish American Fiction (3) Robb
- 266 Seminar: Alfonso Reyes (3) Robb
Alfonso Reyes, the essayist-artist, poet, and complete humanist, as studied in his various prose and poetic works. (Spring—day)
- 287 Seminar: Problems in Latin American Civilization (3) Rodríguez
Interdisciplinary seminar guided by a specialist within the methodology of his chosen discipline; each student writes a report on some aspect of a key theme (i.e., Nationalism) in Latin America's experience. Admission by permission of instructor. (Spring—day)
- 295 Independent Reading and Research in Spanish and Spanish American Literature (arr.)
For students preparing for the Master of Arts degree. May be repeated for credit. (Fall and spring)
- 299–300 Thesis Research (3–3) Staff
(Academic year)

FOURTH GROUP

- 398 **Advanced Reading and Research** (arr.) Staff
 Limited to students preparing for the Doctor of Philosophy general examination. May be repeated for credit. (Fall and spring)
- 399 **Dissertation Research** (arr.) Staff
 Limited to Doctor of Philosophy candidates. May be repeated for credit. (Fall and spring)

Sino-Soviet Studies

See "Institute for Sino-Soviet Studies."

Slavic Languages and Literatures

Professor Helen Yakobson

Associate Professors Nadine Popluiko-Natov, C.A. Moser (*Chairman*)

Assistant Professors G.A. Olkhovsky, Kosara Gavrilovic (*Research*), Mykola Stepanenko, M.A. Kandel, Irene Thompson, Mary Miller

Assistant Professorial Lecturers Victoria Sandor, Juri Jelagin

Bachelor of Arts with a major in Russian Language and Literature (Field-of-Study).—Prerequisite: the Arts and Letters curriculum, page 78.

Required: the general requirements, pages 83–87, and the passing of the major examination at the end of the senior year. The coordinated field of knowledge upon which the student will be examined includes the political, cultural, and social backgrounds of Russian literature; Russian cultural history; the Russian language—its structure and usage. Proficiency in spoken and written Russian language is required. Students who are already proficient in Russian may, upon passing an appropriate examination, waive any or all of the first-group language courses, as well as up to six hours of second-group language courses. The Department provides a proseminar intended to assist the student in his preparation for the major examination.

Master of Arts in the field of Russian Language and Literature.—Prerequisite: the degree of Bachelor of Arts with a major in Russian Language and Literature from this University, or equivalent.

Required: the general requirements, pages 91–97. The 30 semester hours of required work must include a thesis (6 semester hours). The remainder of the program is arranged in consultation with the student's adviser.

Bachelor of Arts in Education with a teaching field in Russian.—Prerequisite: the Education curriculum, page 80.

Required: the Russian option and the professional courses listed on pages 113, 115–16.

Placement Examination: A standardized placement examination given before registration is required of all entering students who wish to continue in college the language begun in high school. Upon completion of the examination, assignment is made to the appropriate course, with credit assigned on the usual basis.

FIRST GROUP

1-2 First-year Russian (3-3)

Yakobson and Staff

A year course: credit toward a degree at this University given on completion of Slav 2. Beginners' course in fundamentals of grammar and pronunciation with graded reading, oral drill, and written practice. Listening comprehension and oral practice in language laboratory. Laboratory fee, \$17.50 a semester. (Slav 1: fall—day and evening. Slav 2: fall—day; spring—day and evening.)

3-4 Second-year Russian (3-3)

Yakobson and Staff

A year course: credit toward a degree at this University given on completion of Slav 4. Systematic review of grammar. Study of special problems of Russian morphology and syntax. Oral and written reports on assigned topics. Prerequisite: Slav 1-2 or two years of high school Russian. Laboratory fee, \$17.50 a semester. (Slav 3: fall—day and evening. Slav 4: fall—evening; spring—day and evening.)

5 Intensive Beginning Russian (6)

Thompson

Classroom (10 hours), laboratory (1 hour). Beginners' intensive course in the fundamentals of Russian phonology, structure, and vocabulary. Emphasis on active command of the spoken and written language. Maximum participation on the part of the student. Drill sessions to facilitate aural comprehension and oral expression. Graded reading and written practice. Listening comprehension and oral practice in language laboratory. Laboratory fee, \$17.50. (Fall—day)

6 Intensive Intermediate Russian (6)

Thompson

Classroom (10 hours), laboratory (1 hour). Intermediate intensive course in Russian morphology, syntax, and vocabulary. Emphasis on active command of the spoken and written language. Drill sessions to facilitate aural comprehension and oral expression. Graded reading and written practice. Maximum participation on the part of the student. Listening comprehension and oral practice in language laboratory. Prerequisite: Slav 2 or 5, or equivalent. Laboratory fee, \$17.50. (Spring—day)

7-8 Intensive Advanced Russian (6-6)

Thompson

Classroom (10 hours), laboratory (1 hour). Emphasis on vocabulary expansion. Systematic review of Russian grammar at an advanced level. Reading and discussion of literary texts, periodicals, and selected texts in social sciences. Oral reports and compositions on assigned topics. Listening comprehension practice in language laboratory. Prerequisite to Slav 7: Slav 4 or 6, or equivalent. Prerequisite to Slav 8: Slav 7. Laboratory fee, \$17.50 a semester. (Slav 7: fall and spring—day. Slav 8: spring—day.)

9-10 Russian Conversation and Composition (3-3)

Staff

Listening comprehension; oral and written practice. Prerequisite: Slav 4 or 6, or permission of instructor. Laboratory fee, \$17.50 a semester. (Academic year—day and evening)

31-32 Elementary Polish (3-3)

Staff

A year course: credit toward a degree at this University given on completion of Slav 32. Beginners' course in the fundamentals of grammar and pronunciation; graded reading, oral drill, and written practice. (1970-71 and alternate years: academic year—evening)

41-42 Elementary Serbo-Croatian (3-3) Staff

A year course: credit toward a degree at this University given on completion of Slav 42. Beginners' course in the fundamentals of grammar and pronunciation; graded reading, oral drill, and written practice. (1971-72 and alternate years: academic year—evening)

47 Beginning Russian for Reading Examination Candidates (0) Staff

For graduate students with little or no knowledge of Russian who intend to use the language as a research tool. No academic credit. Tuition fee, \$204. (Fall—evening)

49 Russian Readings for Nonmajor Students (3) Staff

Primarily for graduate students preparing for reading examinations. Undergraduates admitted with permission of instructor. No academic credit for graduate students. Prerequisite: Slav 4, 6, or 47; or equivalent. (Spring—evening)

91-92 Introduction to Russian Literature (3-3) Staff

Survey of Russian literature, in translation, from earliest periods through literary masterpieces of the 19th and early 20th centuries. Lecture, recitation, and discussion—in English. Term paper required. (Slav 91 and 92: fall and spring—day)

SECOND GROUP**101-2 Readings in Modern Russian (3-3)** Yakobson and Staff

Representative reading and translation of Soviet periodicals and selected texts in social sciences. Study of current political terminology, abbreviations, Soviet idiom. Prerequisite: Slav 4 or 6, or equivalent. (Academic year—day)

109-10 Advanced Russian Conversation and Composition (3-3) Moser

Developing proficiency in oral and written expression. Prerequisite: Slav 10 or equivalent. (Academic year—evening)

125 Russian Linguistic Structure I (3) Thompson

Linguistic description of Russian phonology and morphophonemics. (Fall—day)

126 Russian Linguistic Structure II (3) Thompson

Linguistic description of Russian morphology, syntax, and lexicon. (Spring—day)

128 Dostoevsky, the Man and the Artist (3) Popluiko-Natov

Sources and development of his philosophical, religious, and aesthetic ideas. His influence on Russian and Western literature. Lectures, discussions, and reports—in English. (1971-72 and alternate years: spring—evening)

131 18th Century Russian Literature (3) Moser

Survey course in the history of Russian literature from 1700 to approximately 1820. Discussion of the rise of poetry, classicism, sentimentalism; the beginnings of prose. Course conducted in English; a reading knowledge of Russian required. (1970-71 and alternate years: fall—evening)

141-42 19th Century Russian Literature (3-3) Stepanenko

Major Russian writers and literary trends from end of the 18th century to Chekhov: fiction, poetry, drama. Lectures, individual reports on assigned topics, and class analysis of selected works—in Russian. Prerequisite: Slav 4 or 6, or equivalent. (1970-71 and alternate years: academic year—evening)

143-44 The Russian Novel (3-3) Moser

Genesis and development of the Russian novel. Evolution of form and techniques. Analysis of style, philosophy, and political ideology of representative novels of the 19th and 20th centuries—in English. (1971-72 and alternate years: academic year—day)

145 The Russian Short Story of the 19th Century (3) Popluiko-Natov

Study of historical development of the short story in 19th century Russia. Lectures, reports, and class analysis—in Russian. Prerequisite: Slav 4 or 6, or equivalent. (1971-72 and alternate years: fall—evening)

146 The Russian Short Story of the 20th Century (3) Popluiko-Natov

Study of the historical development of the short story in 20th century Russia. Lectures, reports, and class analysis—in Russian. Prerequisite: Slav 4 or 6, or equivalent. (1970-71 and alternate years: fall—evening)

151-52 20th Century Russian Literature (3-3) Popluiko-Natov

Symbolism, acmeism, futurism, and realism: prose, poetry, drama. Class analysis of selected texts. Recitations and reports in Russian. Prerequisite: Slav 4 or 6, or equivalent. (1971-72 and alternate years: academic year—day)

153 Turgenev (3) Moser

Reading and discussion of Turgenev's works. Emphasis on the novels; major short stories analyzed and some time spent on his plays and other prose works—in English. (1970-71 and alternate years: fall—day)

154 Gogol (3) Moser

Reading and discussion of Gogol's major works. Analytical study of short stories and plays in English. (1970-71 and alternate years: spring—day)

156 Leo Tolstoy, His Life and Works (3) Popluiko-Natov

Evolution of Tolstoy's artistic and philosophical ideas. Tolstoy's impact on Russian literature and society. Lectures, reports, and classroom analysis of his major works—in English. (1970-71 and alternate years: spring—evening)

161-62 Russian Culture (3-3) Olkhovsky

Survey of Russian cultural heritage from origins of ancient Russia to present—in English. Lecture, recitation, discussion, and individual reports on assigned topics. (Academic year—evening)

165 Soviet Literature from the Revolution to World War II (3) Kandel

Basic themes, issues, literary figures of the Soviet 1920's. The fate of literature and writers under increasing state control; Five-year Plan literature. Lecture, discussion, reports—in English. (Fall—evening)

- 166 **Soviet Literature from World War II to the Present (3)** Kandel
Literature in wartime, under Stalinism, and in the "thaws." The new generation of dissident liberals and "underground" literature. Lecture, discussion, reports—in English. (Spring—evening)

- 173 **Russian Lyric Poetry (3)** Staff
Readings in Fet, Tyutchev, Blok, Mayakovsky, Pasternak, and other major poets of the 19th and 20th centuries. Detailed analysis of poetic language, metrics, and techniques of depiction. Course conducted in English with readings in Russian.

- 193-94 **Introduction to Slavic (non-Russian) Literature—in English (3-3)** Kandel
An examination of non-Russian Slavic literatures from their beginnings to the present day. Emphasis on themes, ideas, and styles peculiar to each literature. The impact of national events and culture on each. (Academic year—evening)

- 197 **Special Problems in Teaching Russian (3)** Yakobson
Discussion of methodology, examination of textbooks, observation of classroom procedures. Prerequisite: 18 semester hours of Russian language. (1970-71 and alternate years: fall—evening)

- 199-200 **Proseminar: Readings for the Major in Russian Language and Literature (3-3)** Yakobson
Conferences and group discussions. (Academic year)

THIRD GROUP

- 206 **Old Russian Literature (3)** Moser
Survey of the development of Russian literature from earliest times to the end of the 17th century. Intensive reading and analysis of selected texts—in Russian. (1970-71 and alternate years: fall—evening)

- 215-16 **History of the Russian Literary Language (3-3)** Moser
Slav 215: historical phonology and morphology of the Russian language.
Slav 216: stylistic development of the literary language. (1971-72 and alternate years: academic year—evening)

- 225 **Pushkin and the Poets of His Time (3)** Popluiko-Natov
Pushkin's predecessors; Pushkin's lyrics and dramas. Lermontov—the heir to Pushkin's poetic tradition. (1971-72 and alternate years: fall—evening)

- 253 **Seminar: Literary Criticism (3)** Popluiko-Natov
Study of leading Russian critics and their role in the development of Russian literature; the emergence of various literary schools. (1971-72 and alternate years: spring—evening)

- 254 **Seminar: Literary and Intellectual Currents of the 1860's (3)** Moser
Discussion of literary and intellectual developments in the Russia of the 1860's. Major figures treated in relation to the milieu of their times. Course conducted in English; a reading knowledge of Russian required. (1970-71 and alternate years: spring—evening)

255 Seminar: Main Trends in 20th Century Russian Literature (3) Popluiko-Natov

Study of representative works since 1900; their artistic and social value—in Russian. (1970-71 and alternate years: fall—evening)

256 Seminar: Stylistics in Russian (3) Popluiko-Natov

Study of the development of the Russian language, literary styles, and techniques: words and their aesthetic and political value, phraseological units, word order, and phrase structure. Comparative analysis of literary and nonliterary texts. (1970-71 and alternate years: spring—evening)

299-300 Thesis Research (3-3)

(Academic year)

Sociology

Professors R.W. Stephens, I.H. Cisin, H.J. Parry (*Research*), R.G. Brown (*Chairman*)

Adjunct Professors J.G. Banks, John Gibson

Professorial Lecturers E.E. Jacobson, L.H. Goodman

Associate Professor T.F. Courtless, Jr.

Associate Professorial Lecturers P.J. Palmer, S.H. Turner

Assistant Professors C.S. Harris, Patricia Lengermann, Phyllis Stewart, J.L. Tropea

Assistant Professorial Lecturers W.R. Throckmorton, Charlotte Anker
Lecturer J.D. Spevacek

Bachelor of Arts with a major in Sociology (Departmental).—Prerequisite: the Arts and Letters curriculum, page 78, including Soc 1, 61; and Stat 53 or 104.

Required: in addition to the general requirements, pages 83-87, 24 semester hours in Sociology, which must include 141 and 149.

Master of Arts in the field of Sociology.—Prerequisite: a Bachelor's degree with a major in Sociology or in an approved related field. Applicants should present scores on the Graduate Record Examination, preferably including the Advanced Test in Sociology, and arrange for former professors to write letters of reference to the Graduate School of Arts and Sciences.

Required: the general requirements, pages 91-97, including Soc 142, 231, 233-34. All courses must be approved in advance by the adviser.

Doctor of Philosophy fields of study in Sociology: Complex Organizations, Political Sociology, Social Organization, Social Research Methods, Sociological Theory, Sociology of Education, and Urban Sociology.—See pages 91-95, 97-99, for requirements for the degree.

Departmental prerequisite: Soc 1 and either 2 or 61 are prerequisite to all second- and third-group courses in Sociology.

FIRST GROUP

1-2 Introductory Sociology (3-3)

Soc 1: general principles of sociology; development of culture and personality, impact of groups and institutions on man's social behavior. Survey of fields within sociology. Soc 2: analysis of major social problems

confronting the United States; factors producing social problems, their nature and treatment. (Soc 1: fall—day and evening; spring—day. Soc 2: fall—day; spring—day and evening.)

61 Development of Social Thought (3)

Examination of concepts and theories relevant to the nature of society and human relationships from ancient writings to the 20th century. Prerequisite: Soc 1. (Fall and spring)

SECOND GROUP

110 The Sociology of Work (3)

Brown

Introductory survey of industrial sociology; sociology of occupations and professions; industry-community relations; and analysis of large, complex organizations. (Spring—day)

124 Medical Sociology (3)

Brehm, Brown

Sociological factors and processes which relate to physical and mental health and disease, analysis of patterned social relationships in the field of health and medicine, the hospital as a social system. (Fall—day)

125 Sociology of Religion (3)

Yeide

Introduction to history of the discipline; analysis of reciprocal impact of secular upon religious and religious upon secular institutions. (Fall—day)

126 Urban Sociology (3)

Stephens

Place of the city in larger society; growth of the city, problems of urban living, group life, personality, urban housing, city planning, and suburban development. (Spring—day)

127 Population Problems (3)

Stephens, Stewart

Composition of populations, trends in population growth and population pressure, factors producing population movements, effects of migration, population policies—eugenics and birth control. (Fall—day)

129 Race and Minority Groups (3)

Banks, Gibson, Stephens

Analysis of relationships between dominant and minority groups in society, particularly in the United States; nature and range of problems; analysis of the phenomenon of prejudice. (Fall—day)

130 Social Stratification: Class and Status (3)

Stephens

Nature of class structure, patterns of status, prestige relations, differential class behavior, analysis of comparative social structure and social mobility. (Spring—day)

131 Social Institutions (3)

Hammarberg

Functional analysis of basic social institutions: family, education, religion, economy, and state in the structure of American society. (Spring—day)

133 Sociology of Education (3)

Stephens, Tropea

Analysis of educational systems from an institutional and organizational perspective and as agencies of socialization; relationships of education in general to society, including technological, communal, and subcultural components. (Fall—day)

- 134 Marriage and the Family (3)** Stephens
Courtship as a social process, marriage and marital adjustment, development of the family, parent-child relations, family problems, disorganization, divorce and family reorganization. (Spring—evening)
- 135 Juvenile Delinquency (3)** Courtless, Tropea, Turner
Factors producing delinquency, juvenile detention, the juvenile court, training schools, treatment of offenders. (Fall or spring—day)
- 136 Criminology (3)** Courtless
Nature and distribution of crime as related to the development and operation of criminal law and various social and legal institutions in the urban society. (Fall—day)
- 137 Sociology of Law (3)** Courtless
Law as a social phenomenon and agency of social control. Problems of legal concepts, doctrine, and institutions. Prerequisite: Soc 136. (Spring—evening)
- 138 Social Disorganization (3)** Goodman, Tropea
Analysis of factors contributing to disruption of social groups, institutions, and communities; study of attempts to establish social controls to prevent, minimize, or mitigate the effects of socially disruptive conditions and events. (1971-72 and alternate years: fall and spring)
- 139 Society and the Deviant (3)** Tropea, Turner
Analysis of relationships of society, socialization, and deviancy. Social responses to deviancy and criminal offenders; rehabilitative programs in community, courts, and schools. (Spring—day)
- 141 Social Research Methods (3)** Cisin, Stewart
Introduction to scientific method in the development of social theory and the solution to social problems. Prerequisite: Stat 53 or 104. (Fall and spring)
- 142 Advanced Social Research Methods (3)** Cisin
Translation of concepts into indices and the analysis and interpretation of research results, measurement, scales and scoring, hypothesis testing. Prerequisite: Soc 141. (Fall and spring)
- 144 Public Opinion and Mass Communication (3)** Parry
Communication process with emphasis on international communications, propaganda, and mass media; measurement of propaganda campaigns. (Fall—day)
- 147 Organizational Theory and Behavior (3)** Stewart
Introductory survey of traditional, contemporary theories and research describing behavior in large, complex organizations and their impact on American social life. (Spring—day)
- 149 Modern Sociological Theory (3)** Lengermann, Stephens
Systematic study of contemporary schools of sociological theory, both European and American development; evaluation of scientific contributions of each school. Prerequisite: Soc 61. (Fall and spring—day)

191 Current Emphases in Sociology (3)

Staff

Analysis and evaluation of recent developments in the general field of sociology and a review and discussion of basic concepts. Required course for all sociology majors in the senior year. (Fall—day; spring—day and evening)

THIRD GROUP

210 Seminar: Political Sociology (3)

Lengermann

Review of current social science theory and knowledge about political processes, including concepts of power, influence, authority, decision-making, and communication. Primary focus on the American case, with emphasis on the urban context; introduction of some cross-national and community-level material. (Spring—evening)

211 Seminar: Social Change (3)

Lengermann

A macro-social, comparative, and interdisciplinary analysis of the processes of social change leading to and resulting from urbanization, including changes in motivation, values, and political, economic, and communication systems; the implication of such changes for other areas of institutionalized behavior. (Fall—evening)

220 Religious Institutions in the United States (3)

Palmer, Yeide

Structural variety of religious institutions and patterns of interaction between religious and secular institutions in contemporary American life. (Spring—evening)

227 Seminar: Sociology of Poverty (3)

Jacobson

Problems of definition and analysis with emphasis on emerging concepts and hypotheses; attention to methodological and research questions; implications for public policy and programming; field experience. (Fall—evening)

228 Seminar: Urban Social Problems (3)

Jacobson

Detailed examination of the relationship between various institutions and problems of the city and urban society. Focus on different institutions or problems in different semesters. (Spring—evening)

231-32 Seminar: Advanced Social Research Methods (3-3)

Cisin

Intensive study and evaluation of current trends in the methodology of social research. Discussion on individual student projects and recently published research. (Soc 231: spring).

233-34 Seminar: Theory Construction and Application (3-3)

Lengermann

Critical examination of the elements of current theories in the social sciences with the major objective of developing general principles of theory construction; consideration of the functions of theory in sociological research. (Academic year)

235 Seminar: General Systems Theory (3)

Tropea

Review of the literature associated with general systems theory and its relation to theory construction and research in the social sciences. Systematic inquiry into the implications of a behavioral/systems approach to the analysis and management of societal problems, particularly urban problems. Interdisciplinary focus. (Spring)

237 Seminar: Family Relations (3)

Staff

Recent research and theory on aspects of family structure and functioning, their antecedents in the larger social order, and their consequences for individual family members. Special projects and papers. (Spring—evening)

240 Sociology of Occupations (3)

Brown, Harris

Analysis of occupational roles and structures and changes within them; recruitment and training; adjustment problems at various stages of the career; interrelationships of stratification systems, life styles, and occupations. (Fall—evening)

242 Sociology of Health and Illness (3)

Brown

Sociological analysis of social and cultural factors in the etiology and treatment of illness. Specifically covers social epidemiology, health and the community, the patient and treatment, and social and cultural theory in health and illness. (Spring—evening)

243 Seminar: Industrial Sociology (3)

Harris, Stewart

Analysis of problems of the organization of work in industry, government, business; problems of decision-making, recruitment, allocation of authority, informal organization, and inter-organizational relations. (Spring)

244 Seminar: American Class Structure (3)

Stephens

Analysis of the class structure of American society in continuity and change. Critical review of theories of class, of the methodology of class, and of research reporting social and psychological correlates of class. (Fall—evening)

248 Seminar: Organizational Theory and Behavior (3)

Harris, Stewart

Advanced analysis of theory and behavior in complex organizations relative to defining organizations, examining basic social processes and their relationship to the cultural environment. (Spring—day)

250 Seminar: Science and Society (3)

Analysis of sociocultural and political factors influencing and affecting the development and structure of science. Development of national science policies; relationship of universities, government, and science in the context of society. (Spring—evening)

***259 Law and Criminology I: Search for the Causes of Criminal Behavior (3)**

Courtless

Role which criminological knowledge of crime causation may play in assisting lawyers to appraise the effectiveness of various alternative social and legal devices in controlling deviant behavior. The search for factors related to criminal behavior will be developed historically, with emphasis on current causal theories developed by various disciplines. Model as well as operational penal codes, sentencing and probation practices, and specialized facilities will be analyzed in terms of their relationship to such causal theories. (Fall or spring)

* Same as Law 475 (2). Graduate students registering for Soc 259 make special arrangements with the instructor for supplementary assignments equivalent to one additional semester hour.

*260 **Interdisciplinary Seminar on the Juvenile Court** (3) Ferster

Sociological, psychological, and psychiatric views on prevention, diagnosis, and treatment; analysis of statutes, court rules, and reported cases pertaining to delinquency, dependency, custody, and child abuse; emphasis on the role of the lawyer in this court. (Fall or spring)

†261 **Law and Criminology II: Society's Responses to the Criminal Offender** (3) Courtless

Study of the development and current use of society's three major approaches to the handling of offenders: punitive, mechanical, and correctional. Emphasis on society's changing responses to criminal and delinquent behavior, and research findings concerning effectiveness of these responses. Analysis of treatment strategies to facilitate communication between members of the legal profession and behavior scientists charged with effectuating these strategies. (Fall or spring)

295 **Research** (arr.) Staff

May be repeated once for credit. (Fall and spring)

299-300 **Thesis Research** (3-3) Staff

(Academic year)

FOURTH GROUP

398 **Advanced Reading and Research** (arr.) Staff

Limited to students preparing for the Doctor of Philosophy general examination. May be repeated for credit. (Fall and spring)

399 **Dissertation Research** (arr.) Staff

Limited to Doctor of Philosophy candidates. May be repeated for credit. (Fall and spring)

Spanish

See "Romance Languages and Literatures."

Special Education

Professor Perry Botwin (*Chairman*)

Associate Professors Bertice Cornish, R.S. Cottrell, Jr.

Assistant Professors M.G. Van Dyke, R.W. Prouty, Wretha Petersen, Char-

maine Ciardi

Instructor Kayte Fearn

Lecturers Vera Vinogradoff, G.D. Bravi, Sandra Brode, D.F. Hall, F.D. Prill-

aman

* Same as Law 487 (2). Graduate students registering for Soc 260 make special arrangements with the instructor for supplementary assignments equivalent to one additional semester hour. Mrs. Ferster is Professor of Law in the National Law Center.

† Same as Law 476 (2). Graduate students registering for Soc 261 make special arrangements with the instructor for supplementary assignments equivalent to one additional semester hour.

Programs of study in Special Education leading to the degrees of *Bachelor of Arts in Education*, *Master of Arts in Education*, *Education Specialist*, and *Doctor of Education* are offered by the School of Education (see pages 101-25).

SECOND GROUP

102 Basic Specialized Teaching Techniques and Materials I (3) Fearn

Study and laboratory practice in basic specialized techniques and materials for teaching children considered exceptional. Lectures and laboratory practice. Admission by permission of instructor. Must be taken concurrently with S Ed 189. (Fall—day)

103 Basic Specialized Teaching Techniques and Materials II (3) Fearn

Advanced study and laboratory practice in basic techniques and materials for teaching children considered exceptional. Admission by permission of instructor. Must be taken concurrently with S Ed 190. (Spring—day)

170 Interpersonal/Intrapersonal Relationships for Teachers (3) Prouty, Van Dyke

Consideration of factors leading to successful interaction with children. (Fall—day)

189 Preprofessional Internship: Special Education I (3) Fearn

Supervised internship in school settings providing for student interaction with children with and without handicapping conditions. Admission by permission of instructor. Must be taken concurrently with S Ed 102. (Fall)

190 Preprofessional Internship: Special Education II (3) Fearn

Advanced supervised internship in school settings providing for student interaction with children with and without handicapping conditions. Admission by permission of instructor. Must be taken concurrently with S Ed 103. (Spring)

200 Understanding Young Children (3) Ciardi

Lecture and field experience. Basic concepts of early child development as applied to special education. Admission by permission of instructor. (Fall—evening)

THIRD GROUP

201 Introduction to Special Education (3) Botwin

(Formerly *Introduction to the Education of Exceptional Children*)

Survey course to acquaint prospective teachers with special education and to help them become aware of the various educational modifications necessary to accommodate children in a school program. (Fall—evening)

204 Problems in Urban Education (3) Prouty

Problems and issues in urban education; emphasis on factors affecting successful educational practice in low-income areas. Admission by permission of instructor. (Spring—evening)

240 Educational Programming for Children with Behavioral Problems (3) Van Dyke

Analysis of educational provisions for children with behavioral problems through study of ecological considerations in the light of contemporary

special education theory. Admission by permission of instructor.
(Fall—evening)

241 Preprofessional Internship: Children with Behavioral Problems (3) Van Dyke

(Formerly Preprofessional Internship: Emotionally Disturbed Children)

Practicum experience early in the training sequence, consisting of observation of, and interaction with, children with behavioral problems under the direction of qualified teachers in a field setting and the supervision of the University staff. Admission by permission of instructor.
(Fall)

242 Clinical Teaching of Children with Behavioral Problems (3)
(Formerly Clinical Teaching of Emotionally Disturbed Children)

Lectures and discussions exploring various psychoeducational techniques of teaching children and adolescents with behavioral problems, interpersonal interaction between teachers and disturbed children, use of group factors in the teaching-learning process, and selection of appropriate teaching methods and materials. Admission by permission of instructor.
(Fall—evening)

250 Advanced Specialized Teaching Techniques and Materials (3) Fearn

Lectures and laboratory practice in advanced specialized teaching techniques and materials for diagnostic-prescriptive teaching. Admission by permission of instructor. Must be taken concurrently with S Ed 252.
(Fall—evening)

251 Psychosocial Considerations in Special Education (3) Prouty

Psychological and sociological factors in special education programs and practices. Admission by permission of instructor. (Fall—evening)

252 Professional Internship: Special Education (3) Fearn

Supervised school internship in diagnostic-prescriptive teaching. Admission by permission of instructor. Must be taken concurrently with S Ed 250. (Fall)

***260 Diagnosis of the Educational Needs of Younger Children (3)** Cornish

Lecture-demonstration course designed to explore the existing and experimental diagnostic tools to aid in education planning for young children. Admission by permission of instructor. (Fall)

***261 Special Methods for Teaching Young Children (3)** Ciardi

Study and laboratory practice in specialized techniques and materials for young children. Students develop and experiment with new methods and materials. Admission by permission of instructor. (Spring—evening)

263 Special Teaching of Severely- and Multiply-handicapped Children (3) Cornish, Ciardi

Specialized programs, techniques, and methods for teaching children with severe disabilities. Admission by permission of instructor. (Fall—evening)

* Classes held at Georgetown University.

- *269 Clinical Teaching in Early Childhood Education (3)** Cornish, Prouty
Supervised clinical internship in special education with young children. Admission by permission of instructor. (Fall)
- 290 Practicum in Teaching in Special Education (6)** Fearn
(Formerly *Practicum in Teaching the Mentally Retarded*)
Supervised student teaching in classrooms containing children with a variety of handicaps under the direction of a qualified teacher and the supervision of the University staff. Minimum of 210 clock hours required. Admission by permission of instructor. (Spring)
- 291 Practicum in Teaching Children with Behavioral Problems (9)** Van Dyke
(Formerly *Practicum in Teaching the Emotionally Disturbed*)
Supervised student teaching in programs for children with behavioral problems under the direction of a qualified teacher and the supervision of the University staff. Minimum of 420 clock hours required. Admission by permission of instructor. (Spring)
- 292 Practicum in Teaching Young Children in Special Education (3)** Ciardi
(Formerly *Practicum in Teaching Children with Crippling Conditions, Health Impairment, or Cerebral Palsy*)
Supervised student teaching in special education in classrooms for young children. Minimum of 210 clock hours required. (Spring)
- 294 Practicum in Diagnostic and Prescriptive Teaching (9)** Fearn, Prouty
Supervised diagnostic and prescriptive teaching. Minimum of 420 clock hours required. To be taken concurrently with S Ed 351. Admission by permission of instructor. (Spring)
- 297-98 Individual Study in Special Education (3-3)** Staff
Individual study or research under guidance of staff member. Program and conferences arranged with adviser. Admission by permission of adviser. (Academic year)
- 303 Administration and Supervision of Special Education (3)** Botwin
Philosophy and nature of special education; program organization, administration, and development. Surveying local-level needs; program evaluation and supervision. Admission by permission of instructor. (Spring—evening)
- 304 Recent Research and Trends in Special Education (3)** Cottrell
(Formerly *Recent Research and Trends in Exceptional Children*)
Emphasis on research methodology and considerations. The unique problems of doing research in special education. Procedures and sources for obtaining research funding. Admission by permission of instructor. (Fall—evening)

* Classes held for one-half of the semester at Georgetown University and one-half at George Washington University.

- 306 **Guidance and Counseling Families of Children with Special Needs (3)** Cornish
(Formerly *Guidance and Counseling of Exceptional Children*)
Working with parents and community agencies in meeting the educational and social needs of young children. Admission by permission of instructor. (Spring—evening)
- 308 **Instructional Media and Technology in Education: Past, Present, and Future Relationships and Implications (3)** Cottrell
A review and consideration of technological developments as they affect special education; consideration of operating principles of various kinds of hardware, including printing, audio-visual equipment, television, and computers; status of software for use with hardware. Admission by permission of instructor. (Spring—evening)
- 342 **Seminar: Crisis/Resource Teaching (3)** Van Dyke
(Formerly *Advanced Seminar: Emotional Disturbance*)
Topics and concepts relevant to an exploration of alternative models in the education of children with behavioral problems. Admission by permission of instructor. (Spring—evening)
- 343 **Psychoeducational Diagnosis of Children with Behavior or Learning Difficulties (3)** Van Dyke
Laboratory course designed to develop educational strategies for children who present behavior or learning problems in the schools. Admission by permission of instructor. (Fall)
- 345 **Public School Consultation and Program Planning for Children with Behavioral Problems (3)** Van Dyke
(Formerly *Public School Consultation and Program Planning for Emotionally Disturbed Children*)
Exploration of mental health consultation models in public schools, in-service training programs for educational personnel, and special programming for behaviorally disordered children in the schools. Extensive field work experience in conjunction with the lecture/discussion format. Admission by permission of instructor. (Spring)
- 350 **Diagnostic and Prescriptive Teaching (3)** Prouty
Theory and practice in diagnostic and prescriptive teaching. Rationale, models, techniques, and problems relevant to implementation. Admission by permission of instructor. (Fall—evening)
- 351 **Seminar: Diagnostic and Prescriptive Teaching (3)** Fearn
Examination of concurrent experiences in practicum in diagnostic and prescriptive teaching. To be taken concurrently with S Ed 294. Admission by permission of instructor. (Spring—evening)
- 370 **Intrapersonal Dynamics in Special Education (3)** Prouty, Van Dyke
Small group exploration of intrapersonal factors essential to understanding roles and interpersonal techniques in teaching exceptional children. Admission by permission of instructor. (Spring—evening)

FOURTH GROUP

453-54 Doctoral Internship: Special Education (3-3)

Staff

Supervised professional internship in college teaching, administration, supervision, or private agency function. Each internship individually arranged. Admission by permission of adviser. (Academic year)

490 Interdisciplinary Doctoral Seminar: Special Education (3)

Staff

For advanced doctoral students. Consideration of major issues of philosophy, policy, and practice in special education. Admission by permission of adviser. (Spring)

491 Dissertation Research (arr.)

Staff

(Fall and spring)

Speech and Drama

Professors G.F. Henigan (*Chairman*) (*Director of Forensics*), E.L. Stevens
Professorial Lecturer Gilbert Herer

Associate Professors Lee Bielski, J.W. Hillis (*Director of Speech Pathology and
Audiology*), L.S. Bowling, Sr., W.M. Reynolds

Assistant Professors Joan Regnell, J.P. Fox, Diane Majerus

Assistant Professorial Lecturer Robert O'Connor

Instructor N.C. Garner

Lecturers Lois Richards, Jacqueline Dudley

Bachelor of Arts with a major in Dramatic Art (Departmental).—Prerequisite: the Arts and Letters curriculum, page 78, including Sp&D 1, 11, 32; and 6 hours selected from Engl 51-51, 71-72, or 91-92.

Required: the general requirements, see pages 83-87, including Sp&D 101, 115, 151, 169; and a minimum of 15 additional hours in theater arts and dramatic literature as approved by the adviser. Students must meet the Speech Proficiency requirement established by the Department.

Bachelor of Arts with a major in Speech Communication (Departmental).—Prerequisite: the Arts and Letters curriculum, page 78, including Sp&D 1 and 11.

Required: the general requirements, see pages 83-87, including Sp&D 112, 121, 126, 143-44; and a minimum of 9 additional hours in second-group courses in speech communication and related courses, as approved by the adviser. Students must meet the Speech Proficiency requirement established by the Department.

Bachelor of Arts with a major in Speech Pathology and Audiology (Departmental).—Prerequisite: the Arts and Letters curriculum, page 78, including Sp&D 1 and 11.

Required: the general requirements, see pages 83-87, including Sp&D 101, 171; and a minimum of 18 additional hours in second-group courses in speech pathology and audiology, as approved by the adviser. Students must meet the Speech Proficiency requirement established by the Department.

Master of Arts in the field of Speech Pathology and Audiology.—Prerequisite: the degree of Bachelor of Arts with a major in Speech Pathology and Audiology from this University, or equivalent.

Required: the general requirements, pages 91-97.

Master of Fine Arts in the field of Dramatic Art.—Prerequisite: the degree of Bachelor of Arts from this University, or equivalent.

Required: the general requirements, see pages 91-97, 24 semester hours of second- and third-group courses in drama and dramatic literature and a creative or research thesis.

Bachelor of Arts in Education with a teaching field in Speech and Drama.—Prerequisite: the Education curriculum, page 80.

Required: the Speech and Drama option and the professional courses listed on pages 115–16.

Speech and Hearing Therapy: See Speech and Hearing Clinic, pages 52–53.

Clinical Certification: The Department of Speech and Drama offers preparation for certificates of clinical competence, issued by the American Speech and Hearing Association, in speech pathology and/or audiology. For details consult the Department.

FIRST GROUP

A American Speech for Foreign Students (3) Richards

Class limited to foreign-born students. Instruction in the formation of the sounds of spoken English, with emphasis on rhythm and inflection. International Phonetic Alphabet used. Recording fee, \$5. (Fall and spring—evening)

1 Communicative Speaking and Listening (3) Henigan and Staff

(Formerly *Effective Speaking*)

Basic theories and principles of speech communication; composition, delivery, and criticism of speaking in interpersonal, group, and public situations. Recording fee, \$2. (Fall and spring—day and evening)

11 Voice and Diction (3) Bielski and Staff

Development of naturalness, correctness, and clarity in conversational speech. Analysis and correction of individual speech delivery faults through tapes and weekly performances. Class instruction on concepts of acceptable voice and diction standards. Recording fee, \$4. (Fall and spring—day and evening)

32 Oral Interpretation of Literature (3)

(Formerly *Oral Reading*)

Theory and practice in discovering and communicating orally the meaning in literature through analysis of form and content. Techniques of reading prose, poetry, and drama for listeners. Prerequisite: Sp&D 11. Recording fee, \$2. (Fall and spring—day)

45 Introduction to the Theater (3)

The art of the theater; its literature, aesthetics, and mechanics. Contributions of the playwright, actor, director, and designer examined through lectures, visiting artists, class discussions, and attendance at theatrical performances. Primarily for nonmajors. (Spring—day)

49 Social Dynamics of Speech Communication (3)

Reynolds

A survey of speech communication techniques and rhetorical principles underlying social protest speaking; emphasis on public address of Black Power, the New Left, and the peace movement. (Fall—evening)

SECOND GROUP

101 Phonetics (3)

Majerus

Phonetic and phonemic alphabets and their applications to student's own speech improvement and to such fields as theater, public speaking, speech

correction, radio, television, and foreign languages. Prerequisite: Sp&D 11. Recording fee, \$17.50. (Fall and spring—day)

111 Business and Professional Speaking (3)

Stevens

(Formerly *Effective Speech Communication*)

Study of the communication process in business and professional speaking; practice in presenting technical reports; selling policies, programs, and services; interviews; conferences; speech in training and supervisory activities. Primarily for nonmajors. (Fall—day)

112 Advanced Public Speaking (3)

Reynolds

(Formerly *Sp&D 141 Public Speaking: Advanced Forms*)

In-depth study of and practice in the principles and techniques of persuasive speaking, with emphasis on the psychological factors in audience analysis and adaptation. Prerequisite: Sp&D 1 or permission of instructor. (Spring—day)

115 Acting (3)

Garner

(Formerly *Sp&D 153*)

Study and practice of fundamentals of acting technique: sense memory, improvisation, character analysis, role development. Prerequisite: Sp&D 32. Laboratory fee, \$5. (Fall—day)

116 Advanced Acting (3)

Garner

Advanced study and practice in acting techniques. Prerequisite: Sp&D 115. Laboratory fee, \$5. (Spring—day)

121 Group Discussion and Conference Leadership (3)

Stevens

Process of thinking and problem solving in committees and small groups; methods of leading discussions and conferences. Prerequisite: Sp&D 1 or permission of instructor. (Fall and spring—day)

123 Training the Student Advocate: Special Events (2)

Intensive study in the techniques and methods of preparing students for responsible speaking in public or contests. Workshop emphasizes the logical, motivational, and ethical demands of oratory, extempore speaking, interpretative speaking, and student congress.

124 Training the Student Advocate: Debate (3)

In-depth investigation into the theory and practice of coaching high school debate with special attention to preparing students for competition.

Reynolds

126 Argumentation and Debate (3)

(Formerly *Public Discussion and Debate*)

Study of the advocacy system; special emphasis on issue identification, use of evidence, and logical proof. Extensive practice in argumentative speaking. Prerequisite: Sp&D 1 or permission of instructor. (Spring—day)

127-28 Advanced Debate Practice (1-1)

Admission by permission of instructor, after one semester of satisfactory participation in intercollegiate debate program. May be repeated for a total of 4 semester hours. (Academic year)

133-34 Radio and TV Broadcasting (3-3)

O'Connor

Study of the development of radio and TV industries, station organization and management, equipment, production techniques; practice in prepara-

tion and performance of radio programs. Recording fee for Sp&D 134, \$5.
(Academic year—evening)

135-36 Radio Workshop (1-1)

Practical work in campus radio station. (Academic year)

143 History and Criticism of European Public Address (3)

Reynolds

Survey of speakers and rhetorical methods as they evolved in Western European democracies from the classical period to the present time.
(Fall—day)

144 History and Criticism of American Public Address (3)

Reynolds

Study of American oratory from its pre-Revolution origins to the present day, interpreted in terms of issues and movements. (Spring—day)

151 Stagecraft (3)

Garner

Lecture (2 hours), laboratory (1 hour). Theories and practicum in the technical aspects of production. (Fall—day)

152 Advanced Stagecraft (3)

Garner

Lecture (2 hours), laboratory (1 hour). Theories and practicum in stage lighting and contemporary devices and effects. Prerequisite: Sp&D 151 or permission of instructor. (Spring—day)

154 Play Directing (3)

Fundamentals of play directing. Studies in dramatic composition, character analysis, casting, rehearsing, play analysis. Under supervision of instructor, students cast and prepare scenes for presentation. Prerequisite: Sp&D 115. Laboratory fee, \$5. (Spring—day)

155-56 Play Production Practice (1-1)

Staff

Practical work in theater, including assigned production duties and special projects under supervision of instructor. Admission by permission of instructor. (Academic year)

165-66 History of the Theater (3-3)

An examination of the development and growth of the theater from its beginnings to the present. Sp&D 165: Greek through Restoration. Sp&D 166: the 18th century to the present. (Academic year—evening)

169 Introduction to Creative Dramatics (3)

Study of philosophies and practices underlying dramatics with children; materials and methods for conducting improvised dramatic activities in elementary and secondary education. Students lead classes of children. (Fall—day)

170 Children's Theater (3)

Play and audience analysis, directing methods, production techniques for the child audience. Students participate in Children's Theater productions. Admission by permission of instructor. (Spring—day)

171 Introduction to Speech Pathology and Audiology (3)

Regnell

Survey of the disorders of speech and hearing, including symptomatology, testing, causation; emphasis on problems encountered by the classroom teacher. (Fall—day)

172 Speech Pathology I (3)

Regnell

Pathologies and therapeutic procedures in articulatory and voice disorders and cleft palate. Prerequisite: Sp&D 171. (Spring—day)

173 Speech Pathology II (3)

Fox

Pathologies and therapeutic procedures in stuttering and disorders of central or peripheral nervous systems. Prerequisite: Sp&D 172. (Fall—day)

176 Speech, Hearing, and Language Development (3)

Fox

Study of normal speech and auditory function from prenatal development through the emergence of language. (Spring—day)

182 Introduction to Audiology (3)

Majerus

Overview of the field of audiology to include a review of sound and its properties, anatomy and physiology of auditory system, and methods and procedures of pure tone and speech audiometry, with emphasis on their application to the study of hearing disorders. Demonstration and practicum with the pure tone audiometer. (Fall—day)

183 Clinical Procedures in Speech and Hearing (3)

Regnell

Method, theory, and practice in preparation of therapeutic objectives and materials; practice and observation in speech and hearing evaluation. Prerequisite: Sp&D 172 or 182. (Spring—day)

184 Clinical Practice in Speech and Hearing (1)

Staff

Supervised case work in speech and hearing in the University Speech and Hearing Clinic and selected off-campus facilities. May be repeated for a total of 3 semester hours. Prerequisite or concurrent registration: Sp&D 183. (Fall and spring)

THIRD GROUP**251-52 Play Preparation and Presentation (arr.)**

Staff

Observation and participation in theater production: elements of stagecraft and design, principles and techniques of acting, problems in directing plays. May be repeated for a total of 12 semester hours. Admission by audition or interview. (Academic year)

258 Theater Management (2 to 4)

Staff

Theory and practice in the psychology of handling the public: promotion, box office and house management. Admission by interview. (Fall and spring)

270 Seminar: Children's Theater (3)

Present practices and potentialities of educational theater at all levels of instruction; emphasis on theater for the child audience. (Spring)

275 Research Methods in Speech Pathology and Audiology (3)

Hillis

Study of methods and techniques employed in speech and hearing research. (Fall—day)

277 Advanced Clinical Procedures in Speech and Hearing (arr.)

Staff

(Fall and spring)

- 278 **Advanced Clinical Practice in Speech and Hearing** (arr.) Staff
(Fall and spring)
- 279 **Anatomy and Physiology of Speech and Hearing** (3) Bowling
Study of structures and pathologies of speech and hearing. Laboratory fee, \$15. (Fall—evening)
- 280 **Neurological Speech and Language Disorders** (3) Fox
Evaluation and therapy for speech and language disorders resulting from neurological pathology: aphasia, apraxia, dysarthria, and related disorders. Laboratory fee, \$7.50. (Fall—evening)
- 281 **Advanced Clinical Audiology** (3) Bowling
Principles and methods underlying assessment of auditory disorders; emphasis on bone conduction, masking, and speech intelligibility. Clinical implications, tests, demonstration, and practicum. Laboratory fee, \$7.50. (Fall—evening)
- 282 **Special Auditory Tests** (3) Bowling
Special speech and pure tone audiometric techniques for differentiating conductive, cochlear, and retro-cochlear lesions, for identifying functional hearing losses. Clinical application of tests and interpretation of results. Laboratory fee, \$7.50. (Spring—evening)
- 283 **Community Programs in Speech and Hearing** (3) Herer
Methods and procedures for management of hearing and speech programs; review of hearing conservation and monitoring programs and operational aspects of clinical programs designed to meet the needs of individuals with communicative disorders. Laboratory fee, \$7.50. (Fall—evening)
- 284 **Experimental Phonetics** (3) Hillis
Consideration of research methodology and published research in the study of speech production and reception. Laboratory fee, \$7.50. (Spring—day)
- 285 **Hearing Aids** (3) Majerus
Discussion of hearing aid characteristics and electroacoustic measurements; hearing aid effectiveness in improving communicative efficiency; procedures for selection and clinical evaluation of hearing aids; counseling of the patient. (Spring—evening)
- 286 **Evaluation of Speech and Language Disorders** (3) Fox
Techniques in examination, history taking, patient counseling, and management. Laboratory fee, \$5. (Spring—day)
- 288 **Aural Rehabilitation** (3) Bowling
Systems, principles, and methodologies of auditory training and speech reading to include development of lesson plans and their application in resolving communication problems of acoustically-handicapped individuals. Laboratory fee, \$7.50. (Fall—day)
- 291 **Seminar: Speech Pathology** (3) Staff
Offered in such areas as articulatory problems and delayed speech, aphasia, voice difficulties and cleft palate, stuttering, cerebral palsy, and allied disorders. May be repeated for credit. (Spring—evening)

- 292 **Seminar: Audiology** (3) Staff
Offered in such areas as theories of audition, special auditory tests, aural rehabilitation, psychoacoustics. May be repeated for credit. (Spring—evening)
- 294 **Independent Research in Dramatic Art** (arr.) Staff
May be repeated for credit. (Fall and spring)
- 295 **Independent Research in Speech and Hearing** (arr.) Staff
May be repeated for credit. (Fall and spring)
- 299–300 **Thesis Research** (3–3) Staff
(Academic year)

Statistics

Professors E.H. Johnson (*Emeritus*), H.F. Bright, Solomon Kullback (*Chairman*), H.W. Lilliefors
Professorial Lecturers Samuel Greenhouse, Morton Kupperman, W.W. Wolman
Associate Professors A.D. Kirsch, R.H. Shumway, C.T. Ireland
Associate Professorial Lecturers Sidney Armore, Selig Starr, M.A. Schwartz, R.L. Beatty
Assistant Professors R.E. Thomas, C.R. Mann
Adjunct Assistant Professor J.K. Kern
Assistant Professorial Lecturers Fred Frishman, R.D. Phillips
Lecturers Bert Levy, William Rutiser, Thomas Teeples

Bachelor of Arts or Bachelor of Science with a major in Applied Statistics (Departmental).—Prerequisite: the Arts and Letters or the Science curriculum, respectively, pages 78–79, including Math 31; Stat 91, 97.

Required: the general requirements, pages 83–87, including Math 32 and 34, or Stat 117, 118, 155, 157–58, and 6 additional hours of second-group Statistics courses selected with the approval of the adviser; a minimum of 24 semester hours including Math 124, and courses in other departments approved by the adviser as contributing to a well-organized program. For further details, consult the adviser.

Bachelor of Arts or Bachelor of Science with a major in Mathematical Statistics (Departmental).—Prerequisite: the Arts and Letters or the Science curriculum, respectively, pages 78–79, including Math 31 or former 23; Stat 91.

Required: the general requirements, pages 83–87, including Math 32 and 34, or 24; Stat 117, 118, 157–58, 189–90, and 6 additional hours of second-group Statistics courses selected with the approval of the adviser; a minimum of 24 semester hours, including Math 124, 139, 140, and 157 (Math 250 is recommended), and courses in other departments approved by the adviser as contributing to a well-organized program. For further details, consult the adviser.

Master of Science in the field of Applied Statistics.—Prerequisite: a Bachelor's degree with a major in Applied Statistics at this University, or equivalent. If undergraduate study did not include equivalent of required courses at this University, those courses must be taken as prerequisite to graduate study.

Required: the general requirements, pages 91–97, and a thesis, Stat 299–300. The program consists of at least 12 semester hours of Statistics in addition to the thesis. The remaining 12 hours may include appropriate other courses in an area of interest to the candidate, to be selected in consultation with the adviser.

Master of Arts in the field of Mathematical Statistics.—Prerequisite: a Bachelor's degree with a major in Mathematical Statistics at this University, or equivalent. If undergraduate study did not include equivalent of required courses at this University, those courses must be taken as prerequisite to graduate study.

Required: the general requirements, pages 91–97, including Stat 201–2 or 257–58 and a thesis, Stat 299–300. The remaining 18 hours must be selected in consultation with the adviser.

Doctor of Philosophy fields of study in Mathematical Statistics: Biometrics, Design of Experiments, Econometrics, Information Theory, Multivariate Analysis, Operations Analysis, Sampling, and Statistical Inference.—See pages 91–95, 97–99, for requirements for the degree.

Departmental prerequisite: One entrance unit in algebra is prerequisite to all first-group courses in Statistics.

FIRST GROUP

49 The Language of Statistics (0)

Kirsch

For doctoral students as a minimum option in lieu of a foreign language. No academic credit. Tuition fee, \$272.

*51 Introduction to Business and Economic Statistics (3)

Staff

Lecture (3 hours), laboratory (1 hour). Frequency distributions, descriptive measures, probability, sampling, estimation, tests of hypotheses, correlation, time series, index numbers. Laboratory fee, \$9. (Fall and spring—day and evening)

*52 Mathematics of Finance (3)

Johnson

Interest and discount, annuities, valuation of stocks and bonds, sinking funds, amortization, valuation of depletable assets, depreciation. (Spring—day)

*53 Introduction to Statistics in Psychology and Education (3)

Staff

Lecture (3 hours), laboratory (1 hour). Frequency distributions, descriptive measures, probability, sampling, estimation, tests of hypotheses, correlation, analysis of variance. Laboratory fee, \$9. (Fall—day; spring—day and evening)

*91 Principles of Statistical Methods (3)

Staff

Lecture (3 hours), laboratory (1 hour). Variables and attributes, averages and dispersion, frequency distributions and their characteristics, regression and correlation, statistical decision processes. Laboratory fee, \$9. (Fall and spring)

97 Introduction to Computer Programming (3)

Thomas and Staff

Lecture (2 hours), laboratory (2 hours). Computer and programming concepts. High-level language programs written by students will be run on the University computer. Laboratory fee, \$20. (Fall and spring—day)

* Stat 51, 53, and 91 are related in their subject matter, and credit hours for only one of the three may be applied toward a degree. Stat 52 lies outside of this group, and may be taken for degree credit in combination with any one of the other three.

SECOND GROUP

- *104 Statistics in the Behavioral Sciences and Education I (3)** Staff
Lecture (3 hours), laboratory (1 hour). Introductory study of statistical techniques for research problems in behavioral sciences and education. Laboratory fee, \$9. (Fall—evening)
- 105 Statistics in the Behavioral Sciences and Education II (3)** Kirsch
Lecture (3 hours), laboratory (1 hour). Advanced study of statistical techniques for research problems. Analysis of variance, correlation techniques, chi-square applications, sampling theory. Prerequisite: Stat 53 or 104. Laboratory fee, \$9. (Fall—day; spring—evening)
- 106 Factor Analysis (3)** Kirsch
Concepts of factor analysis and their utility in various phases of research and related topics. Prerequisite: Stat 105 or equivalent. Laboratory fee, \$9.
- 107 Statistics for Engineers (3)** Staff
Probability models, discrete and continuous distributions, sampling, hypothesis testing and estimation, engineering applications. Prerequisite: differential and integral calculus. (Fall—evening)
- 109-10 Quality Control and Reliability Techniques (3-3)**
Statistical methods and probability models for quality control and reliability applications. Prerequisite: Stat 91 or 107.
- 111 Business and Economic Statistics I (3)** Johnson
Statistical processes as tools in decision making in areas of economics and business. Prerequisite: Stat 51 or permission of instructor. (Fall—day and evening)
- 112 Business and Economic Statistics II (3)** Johnson
Case work to illustrate quantitative procedures for solution of economic and business problems. Prerequisite: Stat 111 or equivalent. (Spring—day and evening)
- 113 Computer Programming (3)** Thomas and Staff
Lecture (2 hours), laboratory (2 hours). Computer concepts beyond the introductory level; an introduction to assembly language and advanced high-level language programming. Prerequisite: Stat 97. Laboratory fee, \$20. (Fall)
- 114 Introduction to Computer Operating Systems (3)** Thomas and Staff
Design and implementation of operating systems, program editing and loading, supervisory routines, input-output control, multi-programming, scheduling systems, future trends. Prerequisite: Stat 113. Laboratory fee, \$20. (Spring)
- 115 Programming Languages (3)** Thomas and Staff
Concepts of programming languages, compiler techniques, nonnumeric programming. Prerequisite: Stat 113 or permission of instructor. Laboratory fee, \$20. (Fall)

* May not be taken for credit by students who have received credit for Stat 51, 53, or 91.

- 117 Analysis of Variance (3)** Staff
Lecture (3 hours), laboratory (1 hour). Introduction to the design of experiments and analysis of variance; random block, factorial, Latin square and Graeco-Latin square design; analysis of covariance. Prerequisite: Stat 118. Laboratory fee, \$9. (Fall—day; spring—evening)
- 118 Regression Analysis (3)** Staff
Lecture (3 hours), laboratory (1 hour). Regression and correlation theory; simple, partial, and multiple. Prerequisite: 3 semester hours selected from Stat 51, 53, 91, 104, 107. Laboratory fee, \$9. (Fall—evening; spring—day)
- 119 Bases of Statistical Decision Making (arr.)** Kern
For students in the Navy Graduate Financial Management Program only. Introduction to techniques of decision making, with emphasis on applications rather than theory. Includes binomial distribution, normal distribution, Type I and II errors, estimation, research methodology, and problems of inference.
- 121 Design of Experiments for Behavioral Sciences and Education (3)** Kirsch
Applications of advanced experimental design to research problems in behavioral sciences and education. Prerequisite: Stat 105 or 117 and permission of instructor. (Spring—evening)
- 122 Forecasting Principles and Techniques (3)** Johnson
Survey and appraisal of current economic forecasting techniques and indicators of business conditions. Preparation of an actual forecast. Prerequisite: Stat 51 or equivalent.
- *123 Introduction to Econometrics (3)** Staff
Model construction and quantification of economic theory; relevant statistical processes and role of probability. Prerequisite: Econ 101, 102, and a one-year sequence in calculus. (Fall or spring)
- 131 Contingency Table Techniques (3)** Kullback
Analysis of categorical data. Tests of independence, homogeneity, and interaction in simple and complex contingency tables. Tests of goodness of fit and of Markovity. Prerequisite: Stat 105 or 118, or permission of instructor.
- 155 Introduction to Probability (3)** Staff
Probability distributions, Bayes' theorem and postulate, Bernoulli's theorem and its experimental verification, mathematical expectation, laws of large numbers. Prerequisite: one entrance unit in algebra. (Fall)
- 157-58 Introduction to Mathematical Statistics (3-3)** Staff
Distribution theory, sampling theory, estimation, hypothesis testing, regression analysis, experimental design. Prerequisite: differential and integral calculus. (Academic year—day and evening)
- 161-62 Information Theory (3-3)** Kullback
Elementary development of information theory and applications to communication, coding, psychology, linguistics, etc. Prerequisite: 3 semester hours selected from Stat 107, 155, 157, 189.

* An interdepartmental course offered by the departments of Statistics and Economics.

165-66 Multivariate Techniques (3-3)

Staff

Application of multivariate statistical techniques to multidimensional research data from the behavioral, social, biological, medical, and physical sciences. Prerequisite: Stat 117, 157-58; Math 124. (Academic year)

183 Intermediate Statistical Laboratory (3)

Staff

Applications to advanced experimental design and other topics. Prerequisite: Stat 121 or permission of instructor. (Fall or spring)

187 Theory of Sampling (3)

Staff

Problems of sampling and sample design. Prerequisite: Stat 91 or equivalent. (Fall)

188 Nonparametric Statistical Inference (3)

Lilliefors

Statistical inference when the form of underlying distribution is unspecified. Prerequisite: Stat 91 or equivalent. (Spring)

189-90 Mathematical Probability and Applications (3-3)

Staff

Combinatorial analysis, conditional probability, stochastic independence, probability distributions, random variables, laws of large numbers. Prerequisite: differential and integral calculus. (Academic year—day and evening)

195 Reading and Research in Statistics (arr.)

Staff

May be repeated once for credit. (Fall and spring)

197 Digital Computer Programming with Applications (3)

Thomas

Lecture (2 hours), laboratory (2 hours). Use of digital computer in statistical and other computational work. Writing, debugging, and running programs on the digital computer in the University Computer Center. Prerequisite: Stat 117; or Math 24 or 32; or permission of instructor. Laboratory fee, \$20. (Spring)

THIRD GROUP**201-2 Mathematical Statistics (3-3)**

Ireland

Distribution theory, sampling theory, estimation, sufficient statistics, hypothesis testing, analysis of variance, multivariate, normal distribution. Prerequisite: advanced calculus. (Academic year—evening)

207-8 Operations Analysis (3-3)

Staff

Basic concepts and techniques. Introduction to simulation, linear programming, game theory, queueing theory, inventory theory, and other topics. Admission by permission of instructor. (Academic year)

217-18 Advanced ANOVA and Experimental Design (3-3)

Staff

(Formerly *Experimental Design*)

Advanced theory and application of general linear hypothesis to experimental designs. Prerequisite: Stat 157-58 or 201-2; and Math 124. (Academic year—evening)

231 Contingency Table Analysis (3)

Staff

A study of the theoretical bases underlying the analysis of categorical data. Prerequisite: Stat 201-2 or 257-58.

257-58 Distribution Theory (3-3)

Staff

Random variables, distribution functions, moments, sequences of random variables, characteristic functions, special distributions, sampling theory, asymptotic distributions. Prerequisite: Stat 157-58 or 201-2; and Math 124, 139, 140, 157, 250. (Academic year—evening)

259-60 Advanced Mathematical Probability (3-3)

Staff

Measure theory, probability spaces, random variables, probability distributions, sequences of random variables, conditioning, martingales. Prerequisite: Stat 189-90 and Math 250. (Academic year)

263-64 Topics in Statistical Inference (3-3)

Staff

Estimation, testing of statistical hypotheses, tests of significance, likelihood ratio, likelihood—odds and odds ratio, Bayesian inference and the use of prior knowledge, decision and information theory. Prerequisite: Stat 257-58; or Stat 201-2 and Math 124. (Academic year—evening)

265-66 Multivariate Analysis (3-3)

Staff

Tests of significance, homogeneity, independence, canonical and vector correlations, multivariate normal distribution, generalized Student's ratio, multivariate linear hypothesis, and analysis of variance. Prerequisite: Stat 257-58; or Stat 201-2 and Math 124. (Academic year)

267-68 Characteristic Functions (3-3)

Staff

Fourier integrals, distribution functions, inversion formulas, limit theorems, applications to the distribution problem of statistics. Prerequisite: Stat 189-90; 201-2 or 257-58; and Math 157.

269-70 Statistical Decision Theory (3-3)

Staff

Wald's theory of decision functions. Sequential analysis. Multi-decision problems. Existence theorems, complete class theorems, and other general decision theoretic results. Prerequisite: Stat 189-90; and 201-2 or 257-58.

271-72 Statistical Information Theory (3-3)

Kullback

Basic concepts, definitions, and formulas of information theory; their significance and general properties; inequalities of information theory and sufficiency; applications to statistical problems of discrimination and hypothesis testing. Prerequisite: Stat 201-2 or 257-58; and 259-60. (Academic year)

273-74 Markov Processes (3-3)

Staff

Fundamental notions of Markov chains and processes, generating functions, recurrence, limit theorems, random walks, Poisson processes, birth and death processes, applications. Prerequisite: Stat 189-90; and 201-2 or 257-58.

***275 Econometrics I: Introduction (3)**

Peskin, Heien

Survey of applications and introduction to statistical methods for estimating economic relationships for the economist with some mathematical facility. Prerequisite: 6 semester hours of mathematical statistics and Econ 203-4 and 205, or equivalent as approved by instructor. (Fall—evening)

* An interdepartmental course offered by departments of Statistics and Economics.

- *276 Econometrics II: Theory and Method (3)** Staff
Continuation of Stat 275; emphasis on errors in variables, confluence, non-spherical disturbances, identification, and multi-equation estimation. Prerequisite: Stat 275. Recommended: a course in matrix theory. (Spring—evening)
- *277 Econometrics III: Special Topics in Econometrics (3)** Staff
Continuation of Stat 276. Special topics on a single-equation and multi-equation estimation. Prerequisite: Stat 276 or equivalent. (Fall—evening)
- 281-82 Time Series Analysis (3-3)** Shumway
Stationary and nonstationary time series, auto- and cross-correlation, power spectral analysis, multivariate normal processes, mean square estimation and regression, statistical inference, applications. Prerequisite: Stat 189-90; and 201-2 or 257-58. (Academic year)
- 283 Advanced Statistical Laboratory (3)** Staff
Application of the University computer to complex statistical problems on an individual study basis. Admission by permission of instructor. Laboratory fee, \$20. May be repeated for credit only with permission of the Department. (Fall and spring)
- 285-86 Seminar (3-3)** Staff
Admission by permission of instructor. (Stat 285 and 286: fall and spring)
- 295 Reading and Research (3)** Staff
May be repeated once for credit. (Fall and spring)
- 296 Seminar: Professional Consulting in Statistics (3)** Kirsch
Case studies, data analysis procedures, and problems that a consultant might encounter.
- 297 Seminar: Problems in Mathematical Statistics (3)** Staff
- 298 Seminar: Combinatorial Probability (3)** Staff
- 299-300 Thesis Research (3-3)** Staff
(Academic year)

FOURTH GROUP

- *378 Seminar: Topics in Econometrics (3)** Peskin
Limited to graduate students, primarily for doctoral candidates; offered as demand requires. A research seminar covering current econometric literature. Prerequisite: Stat 276. (Fall or spring)
- 398 Advanced Reading and Research (arr.)** Staff
Limited to students preparing for the Doctor of Philosophy general examination. May be repeated for credit. (Fall and spring)
- 399 Dissertation Research (arr.)** Staff
Limited to Doctor of Philosophy candidates. May be repeated for credit. (Fall and spring)

* An interdepartmental course offered by departments of Statistics and Economics.

Urban and Regional Planning

Associate Professor D.C. McGrath, Jr. (Chairman)

Associate Professorial Lecturers P.H. Friedly, G.A. Shunk

Assistant Professors Sherwin Greene, S.S. Fuller

Assistant Professorial Lecturer J.B. Howes

Programs of study in Urban and Regional Planning leading to the degrees of Master of Urban and Regional Planning, Master of Arts in Government, Master of Public Administration, and Doctor of Public Administration are offered by the School of Government and Business Administration (see pages 127-52).

FIRST GROUP

53 Principles of Urban Planning and Design (3)

An introductory studio course for undergraduates. Basic elements of urban planning and design theory, techniques, and practice are studied through classroom and field problems supplemented by seminars and lectures. Students are taught the use of elementary graphic techniques in urban problem analysis and presentation of proposals. The course is intended to provide an initial survey of planner's role and responsibilities in developing and implementing creative solutions to contemporary urban problems. Admission by permission of instructor.

THIRD GROUP

201 Introduction to Urban Planning (3)

McGrath

Introduction to history, concepts, and activities of urban planning. Discussion of trends in urbanism and the influences of technical and social change. (Fall and spring—evening)

203 Fundamentals of Urban Design (3)

Greene

Planning and design studio work to present planning methods and techniques, examine and apply principles of urban design and land use, analyze physiographic and economic factors affecting community growth and change, and prepare basic planning studies and proposals. (Fall—day and evening)

204 Urban Development Planning (3)

Greene

Planning and design studio to investigate social, environmental, and technological factors in planning for urban transportation and other systems. Synthesis and application of comprehensive planning principles to typical problems of systems growth and development affecting larger urban centers. Team and individual projects to integrate work of several disciplines. Prerequisite: U&RP 203 or permission of instructor. (Spring—evening)

205 Seminar: Urban Housing (3)

Fuller

Consideration of housing problems growing out of increasing urban population. Social, economic, and design aspects of today's housing; foreign and domestic housing programs and policies. (Fall and spring—evening)

207 Land Development Planning (3)

McGrath

Lectures and discussion of selected problems in urban and regional planning emphasizing applications of zoning, urban renewal, and special pro-

grams available for the implementation of development plans. (Spring—evening)

208 Urban Transportation Planning (3)

Shunk

Review and analysis of relationships between land use and the movement of goods and people in urban areas. Consideration of transportation planning principles, policy problems, methods for analyzing demand and systems for urban travel, research and development, and roles of public agencies and private interests in planning and development of various modes. (Fall—evening)

210 Urban Development Economics (3)

Friedly

Consideration of basic economic forces affecting urban growth and change; relationships among cities, metropolitan areas, and regions in the context of the national economy; socioeconomic aspects of urbanization; implications of urban land development policies; interaction of public and private economic functions; basic studies and methods of economic analysis applied in urban and regional development planning. (Spring—evening)

215 Advanced Planning Problems (3)

McGrath, Fuller

Planning and design studio. Investigation of complex problems of the metropolitan region, analysis of findings, formulation of proposals, and presentation of material to faculty and cooperating groups. Multidisciplinary team and individual planning projects. Prerequisite: U&RP 204. (Fall)

218 Metropolitan and Regional Planning (3)

Fuller and Staff

Planning and design studio projects undertaking areawide analyses of complex regions and applying advanced techniques to prepare comprehensive development policies and plans for projected growth. Collaborative projects requiring problem analysis, synthesis, and development of policies and proposals jointly by several graduate study disciplines. (Spring—evening)

221 Land Development Law (3)

Brown*

Study of the various techniques relative to land development; the status of the Federal Government as landlord, vendor, and purchaser; the competitive private market as a form of planning in comparison to governmental planning programs; the functions of the lawyer in the modern real estate transaction involving land acquisition, licenses, codes and permits, development, construction, sale, and financing. Consideration of new forms and concepts of ownership, transportation programs as a part of land development planning, the migration of people and industry as a planning and control factor, and private and public "new town" developments. (RP) (Same as Law 501)

222 Land Use Planning (3)

Nutting

Selected problems in urban development and housing, particular emphasis on programs under current federal and state legislation. (Same as Law 571 (2)†). (Fall or spring)

* Mr. Brown is Professor of Law in the National Law Center.

† Students registering for U&RP 222 make special arrangements with instructor for supplementary assignments equivalent to one additional semester hour. Dr. Nutting is Professor of Law in the National Law Center.

295 Urban Research (3)

Staff

Directed research and investigation of special problems in community development. May be repeated once for credit. (Fall and spring)

299 Thesis Seminar (3)

Staff

Examination of thesis standards, research philosophy, and methodology. (Fall and spring)

300 Thesis Research (3)

Staff

(Fall and spring)

FOURTH GROUP**398 Advanced Reading and Research (arr.)**

Staff

Limited to students preparing for the Doctor of Public Administration general examination. May be repeated for credit. (Fall and spring)

399 Dissertation Research (arr.)

Staff

Limited to Doctor of Public Administration candidates. May be repeated for credit. (Fall and spring)

Zoology

See "Biological Sciences."



FACULTY AND STAFF OF INSTRUCTION

COLUMBIAN COLLEGE OF ARTS AND SCIENCES

GRADUATE SCHOOL OF ARTS AND SCIENCES

SCHOOL OF EDUCATION

SCHOOL OF GOVERNMENT AND BUSINESS ADMINISTRATION

SCHOOL OF PUBLIC AND INTERNATIONAL AFFAIRS

EMERITI

- Antonio Alonso, *Professor Emeritus of Spanish*
M.A. 1922, Indiana University
- Ruth Harriet Atwell, *Professor Emeritus of Physical Education for Women*
Ph.B. 1918, Denison University; M.A. in Ed. 1933, George Washington University
- Gretchen Rogers Bolwell, *Professor Emeritus of German*
B.A. 1930, M.A. 1931, George Washington University; Ph.D. 1938, Johns Hopkins University
- Robert Whitney Bolwell, *Professor Emeritus of American Literature*
B.A. 1916, Case Western Reserve University; M.A. 1917, Ph.D. 1921, Columbia University;
Litt.D. 1957, George Washington University
- Paul William Bowman, *Professor Emeritus of Biology*
B.A. 1924, University of Pennsylvania; M.A. 1928, George Washington University; Ph.D. 1930,
University of Virginia
- Elbridge Colby, *Professor Emeritus of Journalism*
B.A. 1912, M.A. 1913, Ph.D. 1922, Columbia University
- Oswald Symister Colclough, *Professor Emeritus of Law; Dean of Faculties Emeritus; Emeritus Director of the Patent, Trademark, and Copyright Research Institute*
B.S. 1920, U.S. Naval Academy; LL.B. 1935, Sc.D. 1961, George Washington University;
LL.D. 1946, Muhlenberg College
- Alan Thomas Deibert, *Professor Emeritus of Romance Languages*
B.A. 1918, Gettysburg College; M.A. 1922, Harvard University
- William Webster Diehl, *Professor Emeritus of Mycology*
B.A. 1914, Miami University; M.S. 1915, Iowa State University of Science and Technology;
Ph.D. 1932, Harvard University
- James Harold Fox, *Professor Emeritus of Education*
B.A. 1925, M.A. 1926, University of Western Ontario, Canada; Ed.M. 1936, Ed.D. 1937,
Harvard University
- Thomas Willard Holland, *Professor Emeritus of Labor Economics*
B.A. 1923, University of Michigan; LL.B. 1934, Columbia University; Ph. D. 1939, University
of Wisconsin

- Averett Howard, *Professor Emeritus of English Composition*
B.A. 1922, University of California, Berkeley; M.A. 1940, Cornell University
- Thelma Hunt, *Professor Emeritus of Psychology, in Residence*
B.A. 1924, M.A. 1925, Ph.D. 1927, M.D. 1935, George Washington University
- Everett Herschel Johnson, *Professor Emeritus of Statistics, in Residence*
B.A. 1926, DePauw University; M.A. 1929, Lehigh University; Ph.D. 1942, University of Michigan
- Francis Edgar Johnston, *Professor Emeritus of Mathematics*
B.A. 1921, George Washington University; M.A. 1923, Ph.D. 1926, University of Illinois
- Elmer Louis Kayser, *Professor Emeritus of European History; Dean Emeritus of the Division of University Students*
B.A. 1917, M.A. 1918, LL.D. 1948, George Washington University; Ph.D. 1932, Columbia University
- Frances Kirkpatrick, *Professor Emeritus of Home Economics*
B.S. 1919, University of Missouri; M.A. 1929, Columbia University
- Helen Bennett Lawrence, *Professor Emeritus of Physical Education for Women*
B.S. in P.E. 1934, M.A. 1938, George Washington University
- Kurt London, *Professor Emeritus of International Affairs*
Ph.D. 1923, University of Würzburg, Germany
- John Russell Mason, *Librarian Emeritus; Curator of Art Emeritus*
B.A. 1923, M.A. 1925, George Washington University; M.S. in L.S. 1933, Columbia University
- Florence Marie Mears, *Professor Emeritus of Mathematics*
B.A. 1917, Goucher College; M.A. 1924, Ph.D. 1927, Cornell University
- William Henry Myers, *Professor Emeritus of Physical Education, Health, and Recreation for Men*
B.A. 1931, Occidental College; M.A. in Ed. 1941, George Washington University
- Fred Everett Nessell, *Registrar Emeritus*
B.A. 1920, Hiram College
- Richard Norman Owens, *Professor Emeritus of Business Administration*
B.A., B.S. 1917, University of Missouri; M.A. 1922, Ph.D. 1928, University of Chicago; C.P.A. 1923, State of Illinois
- Myrna Pauline Sedgwick, *Administrative Secretary Emeritus*
B.A. 1911, Wellesley College
- Edward Henry Sehr, *Professor Emeritus of German*
B.A. 1911, Ph.D. 1915, Johns Hopkins University
- Ernest Sewall Shepard, *Professor Emeritus of English Literature*
B.A. 1925, M.A. 1927, George Washington University
- Harold Griffith Sutton, *Director of Admissions Emeritus*
B.A. 1918, Ohio State University; M.S. 1921, Columbia University
- James Henry Taylor, *Professor Emeritus of Mathematics*
B.S. 1916, University of Nebraska; M.A. 1920, Princeton University; Ph.D. 1924, University of Chicago
- Kathryn Mildred Towne, *Professor Emeritus of Home Economics*
B.S. 1923, Montana State University; M.A. 1930, Columbia University
- Frank Mark Weida, *Professor Emeritus of Statistics*
B.S. 1913, Kenyon College; Ph.D. 1923, University of Iowa
- Warren Reed West, *Professor Emeritus of Political Science*
B.A. 1918, George Washington University; Ph.D. 1922, Johns Hopkins University
- Samuel Nathaniel Wrenn, *Professor Emeritus of Chemistry, in Residence*
B.A. 1927, M.A. 1929, Duke University; Ph.D. 1935, Pennsylvania State University
- Lawson Edwin Yocum, *Professor Emeritus of Botany*
B.S. 1916, Pennsylvania State University; M.S. 1920, Ph.D. 1924, State College of Iowa
- Donnell Brooks Young, *Professor Emeritus of Zoology*
B.S. 1911, Amherst College; Ph.D. 1923, Columbia University

ACTIVE*

Eugene Abravanel, *Associate Professor of Psychology*

B.A. 1955, University of Michigan; M.A. 1960, Swarthmore College; Ph.D. 1965, University of California, Berkeley

Alice Anderson Adams, *Assistant Clinical Professor of Psychology*

B.F.A. 1948, Ph.D. 1959, University of Oklahoma

Caroline Lander Adams, *Associate Professor of Botany*

B.A. 1925, Illinois College; M.S. 1928, University of Chicago; Ph.D. 1932, University of Wisconsin

Elizabeth Byrne Adams, *Assistant Professor of Management*

B.S. 1955, Queens College, New York; M.A. in Ed. 1957, George Washington University

Richard Henry Adamson, *Associate Professorial Lecturer in Physiology*

B.A. 1957, Drake University; M.S. 1959, Ph.D. 1961, University of Iowa

Lewis Francis Affronti, *Associate Professor of Microbiology*

B.A. 1950, M.A. 1951, State University of New York at Buffalo; Ph.D. 1958, Duke University

Robert Wayne Albers, *Professorial Lecturer in Biochemistry (Brain)*

B.S. 1950, University of Nebraska; Ph.D. 1954, Washington University

Ernest Narinder Albert, *Assistant Professor of Anatomy*

B.S. 1959, High Point College; M.S. 1963, University of Pittsburgh; Ph.D. 1965, Georgetown University

Frank Duane Allan, *Professor of Anatomy*

B.S. 1947, M.S. 1949, University of Utah; Ph.D. 1954, Louisiana State University

John Gage Allee, Jr., *Professor of English; Dean of the Division of University Students*

B.A. 1939, M.A. 1940, George Washington University; Ph.D. 1955, Johns Hopkins University

George Richard Allen, *Associate Professor of Management*

B.S. 1962, M.B.A. 1965, University of Pittsburgh; D.B.A. 1967, Arizona State University

Don Trudeau Allensworth, *Assistant Professor of Political Science*

B.A. 1956, Ohio Wesleyan University; M.B.A. 1957, Ohio State University; M.A. 1960, Ph.D. 1964, American University

Frederick Amling, *Professor of Business Finance*

B.A. 1948, Baldwin-Wallace College; M.B.A. 1949, Miami University; Ph.D. 1957, University of Pennsylvania

William Earl Amos, *Professorial Lecturer in Education*

B.S. in Ed. 1949, Arkansas State Teachers College; M.A. 1950, University of Tulsa; Ed.M. 1959, Ed.D. 1960, University of Maryland

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B.A. 1958, M.D. 1963, Harvard University; M.A. 1960, Cambridge University, England

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B.A. 1949, University of Georgia; M.A. 1950, Northwestern University

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B.A. 1950, Harvard University; LL.B. 1953, M.A. 1958, Ph.D. 1962, University of Pennsylvania

Grover LaMarr Angel, *Professor of Education*

B.A. 1929, High Point College; M.A. in Ed. 1946, Ed.D. 1952, George Washington University

John Lawrence Angel, *Professorial Lecturer in Anatomy and Anthropology*

B.A. 1936, Ph.D. 1942, Harvard University

Charlotte Miriam Anker, *Assistant Professorial Lecturer in Sociology*

B.A. 1955, Temple University

Daniel Appleman, *Professorial Lecturer in Geology*

B.S. 1953, California Institute of Technology; M.A. 1954, Ph.D. 1956, Johns Hopkins University

* The University Faculty is composed of the President of the University, the Vice President for Academic Affairs, the Director of Admissions, the Registrar, the Director of Libraries, the Treasurer, the Director of Health Services, the Administrator of the University Hospital and Clinic, and the membership of the several college and school faculties.

- Sidney Armore, *Associate Professorial Lecturer in Statistics*
B.A. 1937, Brooklyn College
- Philip Elwyn Arsenault, *Associate Professorial Lecturer in Education*
B.A. 1935, M.S. in Ed. 1937, Clark University; Ph.D. 1958, Princeton University
- Joseph Aschheim, *Professor of Economics*
B.A. 1951, University of California, Berkeley; M.A. 1953, Ph.D. 1954, Harvard University
- David Lynn Atkins, *Assistant Professor of Biology*
B.A. 1957, University of Texas at Austin; M.A. 1963, East Texas State University
- Joseph Baclawski, *Professorial Lecturer in International Affairs*
B.A. 1947, M.A. 1948, Ph.D. 1951, University of Michigan
- John Martyn Bailey, *Professor of Biochemistry*
B.S. 1949, Ph.D. 1952, University of Wales
- Martha Ann Bair, *Assistant Professor of Physical Education*
B.S. in Ed. 1958, University of Arkansas; M.A. 1967, University of Maryland
- Robert Edward Baker, *Professor of Education; Assistant Dean of the School of Education*
B.S. in Ed. 1939, State University of New York at Buffalo; M.A. 1954, Catholic University of America; M.A. in Ed. 1956, Ed.D. 1962, George Washington University
- James Gouverneau Banks, *Adjunct Professor of Sociology*
B.A. 1945, Howard University; M.A. 1947, University of Pittsburgh
- Samuel Harvard Barboo, Jr., *Assistant Professorial Lecturer in Epidemiology and Environmental Health*
B.S. 1955, M.P.H. 1957, University of California, Berkeley; Dr.P.H. 1966, University of California, Los Angeles
- Ruth Lillian Aaronson Bari, *Assistant Professor of Mathematics*
B.A. 1939, Brooklyn College; M.A. 1943, Ph.D. 1966, Johns Hopkins University
- Richard Adrian Barrett, *Associate Professor of Business Administration; Director, Navy Graduate Financial Management Program*
B.A. 1930, Amherst College; M.B.A. 1932, Harvard University
- Lloyd Bartholomew, *Associate Professor of Health Care Administration*
B.A. 1936, Th.B. 1938, Th.M. 1941, University of Dubuque; M.A. 1954, Ph.D. 1959, University of Iowa
- *Bette Lee Barton, *Associate Professor of Chemistry*
B.A. 1958, Rutgers, the State University; M.A. 1959, Ph.D. 1963, Columbia University
- Harold Baskin, *Studio Lecturer in Art (Advertising Design)*
- Helen Walker Beals, *Lecturer in Education*
B.S. 1952, Boston University; M.A.T. 1967, M.A. in Ed. 1970, George Washington University
- Katharine Pease Beardsley, *Associate Clinical Professor of Psychology*
B.S. 1932, Beloit College; M.A. 1933, Smith College; Ph.D. 1949, Columbia University
- Richard Lee Beatty, *Associate Professorial Lecturer in Statistics*
B.S. 1950, M.S. 1958, University of Wyoming; M.S. 1952, University of Colorado; Ph.D. 1966, University of Toronto, Canada
- Bruce Becker, *Associate Clinical Professor of Psychology*
B.A. 1950, St. Ambrose College; M.A. 1954, St. Louis University; Ph.D. 1962, Loyola University, Illinois
- Norman Beckman, *Associate Professorial Lecturer in Public Administration*
B.A. 1949, Brooklyn College; M.A. 1952, Syracuse University; Ph.D. 1957, Columbia University
- David Booth Beers, *Assistant Professorial Lecturer in Classics*
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- James Thomas Bennett, *Assistant Professor of Economics*
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* On sabbatical leave spring semester 1971.

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B.A. 1942, University of Minnesota; M.P.A. 1951, Ph.D. 1955, Harvard University

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Ph.D. 1949, University of Vienna, Austria

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B.F.A. in Ed. 1934, University of Pennsylvania; M.A. in Ed. 1948, George Washington University

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B.A. 1958, Haverford College; M.D. 1962, Harvard University

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B.S. 1963, M.A. 1965, University of Maryland

Dorothy Marshall Betz, *Assistant Professor of French*
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Lee Sheward Bielski, *Associate Professor of Speech*
B.S. 1940, Ohio University; M.A. 1944, University of Michigan

John Grover Birdsong, *Associate Professorial Lecturer in Business Administration*
B.Ae. 1961, Georgia Institute of Technology; M.B.A. 1965, Harvard University

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B.S. 1941, Harvard University; M.A. 1948, Ph.D. 1951, University of Chicago

Ethel Joan Blanchette, *Associate Professorial Lecturer in Anatomy*
B.S. 1956, Queens College, New York; M.S. 1959, New York University; Ph.D. 1965, Columbia University

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Joe Morris Blumberg, *Clinical Professor of Pathology*
B.S. 1930, M.D. 1933, Emory University

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B.A. 1953, M.A. 1955, Emory University

Roland Richard Bonato, *Associate Research Professor of Psychology*
B.A. 1954, Case Western Reserve University; M.A. 1957, Ph.D. 1961, University of Connecticut

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B.S. 1927, University of Kansas; M.S. 1928, Ph.D. 1932, University of Illinois; C.P.A. 1938, State of Louisiana

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B.S. 1942, Rutgers, the State University; M.A. 1947, New York University; Ed.D. 1957, Columbia University

David John Boullin, *Special Lecturer in Pharmacology*
B.S. 1956, B.S. 1958, M.S. 1960, University of London, England

Lloyd Spencer Bowling, Sr., *Associate Professor of Speech and Hearing*
B.A. 1954, M.A. 1957, Ed.D. 1964, University of Maryland

Thomas Elliot Bowman, *Adjunct Lecturer in Biological Sciences*
B.S. 1941, Harvard University; M.A. 1948, University of California, Berkeley; Ph.D. 1954, University of California, Los Angeles

Daniel Philip Boyd, *Associate Professor of Management Science*
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Donald Boyer, *Assistant Professorial Lecturer in Mathematics*
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Jerome Bracken, *Professorial Lecturer in Management Science*
B.S. 1956, Carnegie-Mellon University; M.E.A. 1959, George Washington University; D.B.A. 1963, Harvard University

- Henry Alexander Bradford, *Assistant Professor of Epidemiology and Environmental Health*
B.A. 1961, University of Colorado; M.S. 1967, University of California, Los Angeles
- Roscoe Brady, Jr., *Professorial Lecturer in Biochemistry (Brain)*
M.D. 1947, Harvard University
- Barbara Braun, *Lecturer in Art*
B.A. 1961, Cornell University; M.A. 1966, New York University
- Gerald David Bravi, *Lecturer in Special Education*
B.S. 1959, M.S. in Ed. 1965, State University of New York, College at Cortland; M.A. in Ed. 1968, George Washington University
- James Lowell Breen, *Professor of Physical Education*
B.S. 1948, Eastern Illinois University; M.S. 1949, Ph.D. 1959, University of Illinois
- Gloria Godbey Brennan, *Assistant Clinical Professor of Pathology*
B.A. 1949, M.D. 1952, George Washington University
- Marcella Brenner, *Associate Professor of Education*
B.S. in Ed. 1934, Johns Hopkins University; M.A. 1949, American University; Ed.D. 1962, George Washington University
- Alexander Breslow, *Associate Professor of Pathology*
B.S. 1948, M.S., M.D. 1953, University of Chicago
- John Withrow Brewer, *Professor of Political Science and International Law*
B.A. 1926, M.A. 1930, Ph.D. 1932, Princeton University
- Harold Frederick Bright, *Professor of Statistics; Provost and Vice President for Academic Affairs*
B.A. 1937, Lake Forest College; M.S. 1944, University of Rochester; Ph.D. 1952, University of Texas
- A.D. Britt, *Associate Professor of Chemistry*
B.S. 1957, West Texas State University; M.A. 1961, Ph.D. 1963, Washington University
- Sandra Louise Stevens Brode, *Lecturer in Special Education*
B.S. 1963, George Peabody College for Teachers; M.A. in Ed. 1968, George Washington University
- John Caruthers Broderick, *Adjunct Professor of English*
B.A. 1948, Southwestern at Memphis; M.A. 1949, Ph.D. 1953, University of North Carolina at Chapel Hill
- Bernard Beryl Brodie, *Professorial Lecturer in Pharmacology*
B.S. 1931, McGill University, Canada; Ph.D. 1935, New York University
- Elna Riker Broffman, *Lecturer in English*
B.A. 1951, Beaver College; M.A. 1953, Columbia University
- Elizabeth Broomhead, *Associate Clinical Professor of Psychology*
B.A. 1930, Mount Holyoke College; M.A. 1932, Columbia University
- David Springer Brown, *Professor of Management*
B.A. 1936, University of Maine; Ph.D. 1955, Syracuse University
- Laurence Ray Brown, *Assistant Professorial Lecturer in Business Administration*
B.S. in Engr. 1949, D.B.A. 1968, George Washington University; LL.B. 1951, Rutgers, the State University; M.S. in E.E. 1958, University of Pennsylvania
- Raymond Nathan Brown, *Associate Clinical Professor of Anatomy*
M.D. 1943, George Washington University
- Robert Guy Brown, *Professor of Sociology*
B.A. 1949, University of Rhode Island; M.A. 1951, Ph.D. 1960, University of North Carolina at Chapel Hill
- John Robert Buchheit, *Associate Professorial Lecturer in Biological Sciences*
B.S. 1929, Hamline University; M.S. 1932, University of Illinois
- John Alva Bull III, *Assistant Professor of Psychology*
B.A. 1964, M.S. 1965, Central Washington State College; Ph.D. 1969, University of Minnesota

- Kenneth Eugene Bumgarner, *Instructor in Physical Education*
B.S. in Health Ed. 1963, Lock Haven State College; M.A. in Ed. 1966, George Washington University
- Nancy Liddell Bunge, *Instructor in English*
B.A. 1964, Radcliffe College; M.A. 1966, University of Chicago
- W. Warner Burke, *Associate Professorial Lecturer in Education*
B.A. 1957, Furman University; M.A. 1961, Ph.D. 1963, University of Texas at Austin
- James Franklin Burks, *Associate Professor of French*
B.A. 1951, M.A. 1952, University of Cincinnati; Ph.D. 1957, Indiana University
- *Arthur Edward Burns, *Professor of Economics; Dean of the Graduate School of Arts and Sciences*
B.A. 1931, M.A. 1934, University of California, Berkeley; Ph.D. 1935, George Washington University
- William Wesley Burr, Jr., *Professorial Lecturer in Biochemistry (Isotopes)*
B.A. 1947, University of Nebraska; M.S. 1948, Ph.D. 1951, University of Illinois; M.D. 1960, University of Texas at Austin
- Elizabeth Burtner, *Professor of Physical Education*
B.A. 1927, Hood College; M.A. 1935, Columbia University
- Martin Alexander Buzas, *Associate Professorial Lecturer in Geology*
B.A. 1958, University of Connecticut; M.S. 1960, Brown University; Ph.D. 1963, Yale University
- Paul Calabrisi, *Alumni Professor of Anatomy*
B.A. 1931, Catholic University of America; M.A. 1940, George Washington University; Ph.D. (Cantab.) 1955, Cambridge University, England
- Willard Edmund Caldwell, *Professor of Psychology*
B.A. 1940, M.A. 1941, University of Florida; Ph.D. 1946, Cornell University
- Nicholas Phillip Callas, *Associate Professorial Lecturer in Mathematics*
B.S. 1954, U.S. Naval Academy; M.A. 1959, Ph.D. 1966, University of Colorado
- Edward Alan Caress, *Associate Professor of Chemistry*
B.A. 1958, Dartmouth College; Ph.D. 1963, University of Rochester
- Faith Coles Carman, *Studio Lecturer in Applied Music (Harp)*
Mus.B. 1963, Catholic University of America
- Gerald Vincent Carroll, *Professor of Geology*
B.A. 1943, Lehigh University; Ph.D. 1952, Yale University
- Thomas Frank Carroll, *Adjunct Professor of Economics*
B.A. 1942, Case Western Reserve University; M.S. 1947, Ph.D. 1950, Cornell University
- Wesley Thomas Carroll, *Professor of Education*
B.S. 1933, Iowa State University of Science and Technology; M.A. 1940, Ph.D. 1952, University of Nebraska
- Henry James Cassidy, *Adjunct Assistant Professor of Economics*
B.S. 1965, Carroll College, Wisconsin; M.A. 1966, Ph.D. 1968, University of Illinois
- Marie Mullaney Cassidy, *Associate Professor of Physiology*
B.S. (General) 1957, B.S. (Special) 1958, M.S. 1959, Ph.D. 1962, National University of Ireland
- Fenner Albert Chace, Jr., *Adjunct Lecturer in Biological Sciences*
B.A. 1930, M.A. 1931, Ph.D. 1934, Harvard University
- William Weymouth Chase, *Professorial Lecturer in Education*
B.A. 1948, M.A. 1949, Colorado State College; Ed.D. 1956, Indiana University
- George Cheely, *Assistant Professorial Lecturer in Journalism*
B.S. 1952, University of Maryland
- Mary Jane Cherry, *Lecturer in English*
B.F.A. 1961, University of Texas at Austin; M.A. 1969, Georgetown University
- Stephen Reed Chitwood, *Assistant Professor of Public Administration*
B.A. 1962, University of Colorado; M.P.A. 1965, Ph.D. 1966, University of Southern California

* On sabbatical leave fall semester 1970-71.

- William Andrew Christenberry, Jr., *Studio Lecturer in Art (Painting)*
B.F.A. 1958, M.A. 1959, University of Alabama
- John Bert Christensen, *Associate Professor of Anatomy*
B.A. 1954, Brigham Young University; M.S. 1955, Ph.D. 1958, University of Oklahoma
- Yang-Ming Chu, *Assistant Professor of Microbiology*
B.S. 1959, University of Washington; M.S. 1964, Ph.D. 1967, George Washington University
- Lloyd Eugene Church, *Associate Professorial Lecturer in Anatomy*
B.A. 1942, West Virginia University; D.D.S. 1944, University of Maryland; M.S. 1951, Ph.D. 1959, George Washington University
- Charmaine Lisée Ciardi, *Assistant Professor of Special Education*
B.A. in Ed. 1964, M.A. in Ed. 1965, Ed.D. 1969, George Washington University
- *Ira Hubert Cisin, *Professor of Sociology*
B.S. 1939, New York University; M.A. 1951, Ph.D. 1957, American University
- Astere Evarist Claeysens, Jr., *Associate Professor of English*
B.A. 1948, University of Illinois; M.A. 1952, Columbia University
- Jay Wood Claiborne, *Assistant Professor of English*
B.A. 1962, Southern Methodist University; M.A. 1965, Ph.D. 1969, University of Texas at Austin
- Jeanette Gayle Clapp, *Assistant Professor of Physical Education*
B.S. 1959, East Carolina University; M.S. 1961, Ohio University
- Ronald Grey Clark, *Assistant Professorial Lecturer in Anatomy*
B.A. 1960, Johns Hopkins University; M.S. 1963, Ph.D. 1966, George Washington University
- Carl William Clewlow, *Professorial Lecturer in Management Science*
B.A. in Govt. 1949, M.A. in Govt. 1951, George Washington University
- Daniel Raymond Cloutier, *Professor of Public Administration*
B.A. 1949, Bates College; M.P.A. 1951, University of Michigan; Ph.D. 1961, University of Alabama
- Anthony George Coates, *Associate Professor of Geology*
B.S. 1959, Ph.D. 1963, University of London, England
- James Harold Coberly, *Professor of English*
B.A. 1933, M.A. 1938, Ph.D. 1949, George Washington University
- Kenneth Rae Coburn, *Professorial Lecturer in Physiology*
B.S. 1948, Hillsdale College; Ph.D. 1960, Ohio State University
- Patricia Smith Cochran, *Studio Lecturer in Applied Music (Violin)*
B.A. 1951, American University
- Mary Ann Bieter Coffland, *Associate Professor of Romance Languages*
B.A. 1952, College of St. Catherine; M.A. 1957, Ph.D. 1965, University of Minnesota
- Helen Briesmeister Coffman, *Studio Lecturer in Applied Music (Cello)*
B.A. 1948, College of William and Mary
- Max Harry Cohen, *Assistant Professorial Lecturer in Microbiology*
B.A. 1961, Columbia University; M.D. 1965, Harvard University; M.Phil. 1969, Ph.D. 1970, George Washington University
- Stanley Lee Cohen, *Assistant Professorial Lecturer in Psychology*
B.A. 1963, M.A. 1966, George Washington University
- Victor Hugo Cohn, Jr., *Associate Professor of Pharmacology*
B.S. 1952, Lehigh University; M.A. 1954, Harvard University; Ph.D. 1961, George Washington University
- †Charles William Cole, *Professor of English; Dean of the Summer Sessions*
B.A. 1930, M.A. 1931, Ph.D. 1939, George Washington University
- Mary Ellen Coleman, *Professor of Education; Director, Reading Center*
B.S. 1947, Madison College; M.A. in Ed. 1950, George Washington University
- Calva Kephart Collier, *Lecturer in Physical Education*
B.S. in P.E. 1949, George Washington University

* On sabbatical leave 1970-71.

† On sabbatical leave spring semester 1971.

- Frederick Collier, *Lecturer in Geology*
B.S. 1958, Tufts University
- Janet Chase Collins, *Instructor in English*
B.A. 1963, M.A. 1964, University of Missouri
- Leonard Cornelius Collins, *Professorial Lecturer in Business Administration*
B.A. 1943, Boston College; LL.B. 1946, Catholic University of America; LL.M. 1953, Georgetown University
- George Frederick Conner, *Assistant Professor of Business Administration*
B.S. 1929, U.S. Military Academy; M.B.A. 1938, Harvard University
- Catherine Marie Cook, *Instructor in English*
B.A. 1954, M.A. 1960, Loyola University, Illinois
- Charles Barrie Cook, *Assistant Clinical Professor of Pathology*
B.S. 1945, Hampden-Sydney College; M.D. 1948, George Washington University
- Howard Lee Coppenbarger, *Associate Professorial Lecturer in Journalism*
- Bertice Andrews Cornish, *Associate Professor of Special Education*
B.S. 1954, M.A. 1955, Ed.D. 1962, Columbia University
- Donald Thomas Corrigan, *Studio Lecturer in Art (Sculpture and Drawing)*
B.F.A. 1966, University of Illinois; M.F.A. 1968, Maryland Institute, College of Art
- Raymond Sheary Cottrell, Jr., *Associate Professor of Special Education*
B.S. 1955, State University of New York at Albany; M.S. 1959, Ed.D. 1967, Syracuse University
- Thomas Francis Courtless, Jr., *Associate Professor of Law and Sociology*
B.A. 1955, Pennsylvania State University; M.A. 1960, Ph.D. 1966, University of Maryland
- *Milton Crane, *Professor of English*
B.A. 1937, M.A. 1938, Columbia University; M.A. 1941, Ph.D. 1942, Harvard University
- Roger Frank Cressey, *Adjunct Lecturer in Biological Sciences*
B.A. 1956, M.A. 1958, Ph.D. 1965, Boston University
- William Henry Crocker, *Adjunct Professor of Anthropology*
B.A. 1950, Yale University; M.A. 1953, Stanford University; Ph.D. 1962, University of Wisconsin
- John Croxall, *Assistant Professorial Lecturer in Accounting*
B.A. 1938, M.A. 1941, Columbia University
- Jonathan Walkley Cummings, *Associate Clinical Professor of Psychology*
B.A. 1949, University of Vermont; Ph.D. 1954, University of Illinois
- Francis Lawrence Cundari, *Assistant Professorial Lecturer in Management Science*
B.S. in C.E. 1957, Tufts University; B.S. in Ae.E. 1964, U.S. Naval Postgraduate School
- Nathan Cutler, *Assistant Professorial Lecturer in Accounting*
B.B.A. 1948, City College, New York; M.B.A. 1952, New York University
- Richard Lawson Dabney, *Instructor in English*
B.A. 1966, M.A. 1969, American University
- Marjorie Catlin Daly, *Assistant Professorial Lecturer in Education*
B.A. 1938, Wichita State University; M.Mus.Ed. 1947, Northwestern University
- Dwight David Darland, *Professorial Lecturer in Education*
B.S. 1939, Wayne State College; M.A. 1942, University of Wyoming; Ed.D. 1947, Columbia University
- Anita Mallinckrodt Dasbach, *Assistant Professor of International Affairs*
B.J. 1951, University of Missouri; M.A. in Govt. 1963, Ph.D. 1968, George Washington University
- †Roderic Hollett Davison, *Professor of European History*
B.A. 1937, Princeton University; M.A. 1938, Ph.D. 1942, Harvard University

* On sabbatical leave spring semester 1971.

† On sabbatical leave 1970-71.

- Louis De Alessi, *Professor of Economics*
B.A. 1954, M.A. 1955, Ph.D. 1961, University of California, Los Angeles
- Vincent James DeAngelis, *Professor of Physical Education*
B.S. in P.E. 1939, M.A. in Ed. 1948, George Washington University
- Evelyn Lohoefer DeBoeck, *Associate Professorial Lecturer in Physical Education*
B.S. 1942, University of North Carolina at Greensboro
- Rosalie Frances De Giovanni-Donnelly, *Assistant Professorial Lecturer in Microbiology*
B.A. 1947, M.A. 1953, Brooklyn College; Ph.D. 1961, Columbia University
- Harold Charles Demood, *Adjunct Associate Professor of Management*
B.A. 1956, University of Connecticut; M.B.A. 1960, Air Force Institute of Technology; M.P.A. 1969, American University
- Frank Landt Dennis, *Professorial Lecturer in Journalism*
B.A. 1929, University of Oklahoma; LL.B. 1935, Harvard University
- Linda Grant DePauw, *Associate Professor of American History*
B.A. 1961, Swarthmore College; Ph.D. 1964, Johns Hopkins University
- Malinee Peris de Silva, *Studio Lecturer in Applied Music (Piano)*
- Alton Harold Desmond, *Professor of Zoology*
B.S. 1949, Hartwick College; M.S. 1951, Ph.D. 1954, Brown University
- Harry Grubb Detwiler, *Professor of Education*
B.S. 1936, West Chester State College; M.A. in Ed. 1952, Ed.D. 1961, George Washington University
- Thomas Deuel, *Professorial Lecturer in Biochemistry (Enzymology)*
B.A. 1957, Princeton University; M.D. 1961, Columbia University
- Barend de Vries, *Adjunct Professor of Economics*
M.S. 1946, University of Utrecht, Netherlands; Ph.D. 1951, Massachusetts Institute of Technology
- Jessie Carleton Calver Dickens, *Assistant Professorial Lecturer in Biological Sciences*
B.A. 1939, M.S. 1969, George Washington University
- Paul McGregor Dickie, *Associate Professorial Lecturer in Business Administration*
B.A.Sc. 1961, University of British Columbia; M.B.A. 1966, D.B.A. 1968, University of Southern California
- Alice Reid Digilio, *Instructor in English*
B.A. 1964, Salem College, North Carolina; M.A. 1966, Lehigh University; B.Phil. (Oxon.) 1968, Oxford University, England
- Joseph Amedeo Di Paolo, *Associate Professorial Lecturer in Anatomy*
B.A. 1948, Wesleyan University; M.S. 1949, Case Western Reserve University; Ph.D. 1951, Northwestern University
- Salvatore Frank Divita, *Associate Professor of Business Administration*
B.I.E. 1953, New York University; M.B.A. 1956, Ohio State University; D.B.A. 1968, Harvard University
- Wallace Bruce Dobry, *Assistant Professorial Lecturer in Music*
Mus.B. 1956, Peabody Institute of the City of Baltimore
- James Carlton Dockeray, *Professor of Finance; Dean of the School of Government and Business Administration*
B.A. 1929, Ohio Wesleyan University; M.A. 1931, Ph.D. 1936, Ohio State University
- Andrea Doman, *Assistant Clinical Professor of Psychology*
Ph.D. 1940, Pazmany University, Hungary; Ph.D. 1961, Catholic University of Louvain, Belgium
- Gerald Donaldson, *Assistant Professor of Philosophy*
B.A. 1964, M.A. 1966, Tulane University of Louisiana; Ph.D. 1969, University of Virginia

- Jesse Frank Doubleday, *Professorial Lecturer in Business Administration*
B.S. 1954, University of Maryland; M.A. 1955, George Washington University
- Donald Sterling Douglas, *Associate Professor of Zoology*
B.A. 1957, Oberlin College; Ph.D. 1963, Duke University
- Leah Douthitt, *Lecturer in English*
B.A. 1961, University of Evansville; M.A. 1967, Indiana University
- Thomas Downing, *Studio Lecturer in Art (Painting)*
B.A. 1948, Randolph-Macon College
- Daniel Maccabaeus Dribin, *Professorial Lecturer in Mathematics*
B.S. 1933, M.S. 1934, Ph.D. 1936, University of Chicago
- Jacqueline Hastings Dudley, *Lecturer in Speech*
B.A. 1948, University of Maryland; M.A. 1965, George Washington University
- Barbara Joan Dunham, *Assistant Professor of English; Assistant Dean of Columbian College of Arts and Sciences*
B.A. 1961, George Washington University; M.A. 1963, Mills College
- Robert Martin Dunn, Jr., *Associate Professor of Economics*
B.A. 1960, Williams College; M.A. 1963, Ph.D. 1967, Stanford University
- William Rankin Duryee, *Research Professor of Pathology (Experimental)*
B.A. 1927, Ph.D. 1933, Yale University
- William Sherman Dutterer, *Studio Lecturer in Art (Design)*
B.F.A. 1965, M.F.A. 1967, Maryland Institute, College of Art
- Evelyn Giles Dyer, *Studio Lecturer in Art (Drawing and Design)*
B.A. 1949, Judson College, Alabama; M.A. 1965, University of Alabama
- Hazel Mary Eagle, *Instructor in English*
M.A. 1955, Cambridge University, England
- Roy Brandon Eastin, *Professor of Business Administration*
B.A. 1943, M.A. 1945, George Washington University; Ph.D. 1953, American University
- Frederick Coggeshall Edmundson, *Lecturer in Chemistry*
B.A. 1934, Willamette University; M.A. 1936, Oregon State University; LL.B. 1952, George Washington University
- Raymond Einhorn, *Associate Professorial Lecturer in Accounting*
B.S. 1935, University of Florida; M.S. 1937, University of Illinois; C.P.A. 1943, State of Illinois
- Richard Lee Eisenman, *Associate Professorial Lecturer in Mathematics*
B.A. 1949, College of the Holy Cross; M.A. 1951, University of Connecticut; Ph.D. 1964, University of Michigan
- Julian Eisenstein, *Professor of Physics*
B.S. 1941, M.A. 1942, Ph.D. 1948, Harvard University
- Norma Meister Eittington, *Assistant Professorial Lecturer in Education*
B.A. 1949, Ohio State University; M.A. 1951, Columbia University
- Shirley Marie Elder, *Assistant Professorial Lecturer in Journalism*
B.A. 1954, Stanford University
- Rodney Eldridge, *Associate Professor of International Finance*
B.A. 1949, M.A. 1959, University of Vermont; Ph.D. 1966, Columbia University
- Robert Ellert, *Associate Professorial Lecturer in Political Science*
B.A. 1946, B.C.L. 1949, College of William and Mary; S.J.D. 1962, George Washington University
- Charles Fox Elliott, *Associate Professor of Political Science and International Affairs*
B.A. 1953, Ph.D. 1964, Harvard University; M.A. 1958, University of California, Berkeley
- Lloyd Hartman Elliott, *Professor of Higher Education; President of the University*
B.A. 1937, Glenville State College; M.A. 1939, LL.D. 1967, West Virginia University; Ed.D. 1948, University of Colorado; LL.D. 1963, University of New Hampshire; LL.D. 1965, Colby College; LL.D. 1966, Concord College; LL.D. 1969, University of Maine

- John Neil Ellison, *Assistant Professorial Lecturer in Economics*
B.S. 1953, M.S. 1960, Virginia Polytechnic Institute; D.B.A. 1969, George Washington University
- William Francis Enos, *Assistant Clinical Professor of Pathology*
B.A. 1942, Dartmouth College; M.D. 1945, State University of New York, Downstate Medical Center
- Richard Ferdinand Ericson, *Professor of Management*
B.A. 1943, M.B.A. 1948, University of Chicago; Ph.D. 1952, Indiana University
- Grace Elizabeth Orvis Evans, *Professorial Lecturer in Art*
B.A. 1943, M.A. 1946, University of Minnesota
- Sergio Egidio Fabro, *Associate Research Professor of Pharmacology*
M.D. 1956, University of Milan, Italy; Ph.D. 1966, Ph.D. 1968, University of Rome, Italy; Ph.D. 1967, University of London, England
- Stanley Alan Fagen, *Assistant Clinical Professor of Psychology*
B.S. 1957, Brooklyn College; M.A. 1959, Ph.D. 1963, University of Pennsylvania
- Winfield Harrison Farthing, *Assistant Professorial Lecturer in Management Science*
B.S. in E.E. 1957, North Carolina State University at Raleigh; M.S. in E.E. 1961, Ph.D. 1969, Catholic University of America
- Kayte Marsh Fearn, *Instructor in Special Education*
B.A. 1940, Knoxville College; M.A. in Ed. 1967, George Washington University
- Mead Mather Feick, *Lecturer in English*
B.A. 1959, Haverford College
- *Barry Charles Field, *Assistant Professor of Economics*
B.S. 1956, M.S. 1959, Cornell University; Ph.D. 1967, University of California, Berkeley
- Nicolae Filipescu, *Associate Professor of Chemistry*
Ph.D. 1957, University of Industrial Chemistry, Polytechnical Institute, Rumania; Ph.D. 1964, George Washington University
- Glenna Cady Fitzgerald, *Instructor in Pharmacology*
B.S. 1953, M.S. 1964, University of Massachusetts; Ph.D. 1968, Yale University
- Lester Walter Fix, *Assistant Clinical Professor of Pathology*
M.D. 1943, State University of New York at Buffalo
- Martin Flavin, *Professorial Lecturer in Biochemistry*
B.S. 1944, Stanford University; M.D. 1947, University of California, Berkeley; Ph.D. 1951, Columbia University
- †Roland Fleischer, *Associate Professor of Art*
B.A. 1952, Western Maryland College; M.A. 1954, Ph.D. 1964, Johns Hopkins University
- Daniel Barry Fleming, Jr., *Assistant Professorial Lecturer in Education*
B.A. 1953, M.A. 1954, West Virginia University; Ed.D. 1970, George Washington University
- Brady Jones Fletcher, *Assistant Professorial Lecturer in Education*
B.A. 1950, Clark College, Georgia; M.A. 1953, Howard University; Ed.S. 1967, George Washington University
- Ronald Joseph Fonte, *Lecturer in English*
B.A. 1968, George Washington University
- Paul Lowe Foster, *Associate Professorial Lecturer in Business Administration*
B.S. 1950, Northwestern University; M.B.A. 1963, George Washington University; D.B.A. 1969, University of Virginia
- Robert Foster, *Studio Lecturer in Art (Calligraphy and Lettering)*
B.S. 1917, Pennsylvania State University

* On leave of absence 1970-71.

† On sabbatical leave spring semester 1971.

Joseph Paul Fox, *Assistant Professor of Speech*

B.A. 1964, Central Methodist College; M.S. 1965, Central Missouri State College; Ph.D. 1970, Indiana University

Richard John Frankie, *Associate Professor of Education*

B.A. 1952, M.A. 1955, University of Michigan; Ed.D. 1966, Wayne State University

Eugene Wallace Frederick, *Studio Lecturer in Art (Etching and Relief Printing)*

John Eric Fredland, *Assistant Professor of Economics*

B.A. 1964, Harvard University; M.A. 1966, University of Michigan

Roderick Stuart French, *Instructor in the Humanities*

B.A. 1954, Kenyon College; B.D. 1957, Episcopal Theological School; S.T.M. 1965, Union Theological Seminary

John Andrew Frey, *Associate Professor of Romance Languages*

B.A. 1951, M.A. 1952, University of Cincinnati; Ph.D. 1957, Catholic University of America

Philip Howard Friedly, *Associate Professorial Lecturer in Urban and Regional Planning*

B.A. 1960, M.A. 1964, Ph.D. 1966, University of Southern California

Fred Frishman, *Assistant Professorial Lecturer in Statistics*

B.B.A. 1947, City College, New York; B.A. 1956, M.A. 1957, George Washington University

David Frost, *Associate Clinical Professor of Epidemiology and Environmental Health*

B.S. 1931, New York University; M.D. 1935, St. Louis University; M.P.H. 1941, Harvard University

Stephen Souther Fuller, *Assistant Professor of Urban Planning*

B.A. 1962, Rutgers, the State University; M.C.P. 1964, University of Mississippi; Ph.D. 1969, Cornell University

Charles Edward Galbreath, *Professor of International Economics*

B.A. 1931, Colgate University; M.A. 1932, Ph.D. 1941, Cornell University

Matthew Gallagher, *Professorial Lecturer in International Affairs*

Ph.B. 1941, Providence College; M.A. 1948, Ph.D. 1960, Harvard University

*Michael Graham Gallagher, *Associate Professor of Accounting*

B.A. in Govt. 1960, J.D. 1964, George Washington University; C.P.A. 1965, State of Virginia

Linda Lou Gallo, *Assistant Research Professor of Biochemistry*

B.S. 1959, West Virginia University; M.S. 1963, Ph.D. 1969, George Washington University

†Robert Norton Ganz, Jr., *Associate Professor of English*

B.A. 1949, M.A. 1951, Ph.D. 1959, Harvard University

Siegfried Garbuny, *Associate Professorial Lecturer in Business Administration*

Ph.D. 1938, University of Freiburg, Germany

Blanche Hatfield Gardner, *Lecturer in German*

B.A. 1940, Mount Holyoke College; M.A. 1942, University of Wisconsin

Floris Garner, *Assistant Clinical Professor of Pathology (Comparative)*

B.S. 1948, D.V.M. 1950, Washington State University

Nathan Conant Garner, *Instructor in Speech and Drama*

B.A. 1963, Tufts University; M.A. 1966, University of North Carolina at Chapel Hill

Harry Irving Gates, *Assistant Professor of Art*

B.F.A. 1958, M.F.A. 1960, University of Illinois

James David Gates, *Assistant Professorial Lecturer in Education*

B.A. 1951, Hiram College; M.A. 1956, Columbia University

Kosara Gavrilovic, *Assistant Research Professor of Russian*

B.A. 1945, M.A. 1947, Cambridge University, England

* On sabbatical leave spring semester 1971.

† On sabbatical leave fall semester 1970-71.

- Lyndale Harpster George, *Associate Professor of Physical Education*
B.S. in P.E. 1948, M.A. in Ed. 1952, A.P.C. 1961, George Washington University
- James Francis Giampaoli, *Studio Lecturer in Art (Drawing)*
B.A. 1963, M.A. 1966, University of Maryland
- Frederick Harrell Gibbs, *Gordon Arthur Friesen Professor of Health Care Administration*
B.S. 1958, University of Maryland; M.H.A. 1959, University of Minnesota
- John Gibson, *Adjunct Professor of Sociology*
B.A. 1960, Morehouse College
- Phyllis Eleanor Gieseler, *Studio Lecturer in Applied Music (Voice)*
- Howard Frank Gillette, Jr., *Assistant Professor of American Civilization*
B.A. 1964, Yale University
- Joan Sherako Gimlin, *Lecturer in English*
B.A. 1954, Vassar College; M.A. 1967, George Washington University
- Leon Gintzig, *Professor of Hospital Administration*
B.S. 1947, Boston University; M.S. 1954, Northwestern University; Ph.D. 1958, University of Iowa
- Jean Marie Gladding, *Lecturer in English; Acting Assistant Dean of the Division of University Students*
B.A. 1964, M.A. 1966, George Washington University
- Gerald John Glassman, *Assistant Professorial Lecturer in Business Administration*
B.A. in Govt. 1950, M.B.A. 1966, George Washington University
- Irving Isadore Glick, *Associate Professor of Mathematics*
B.A. 1953, Johns Hopkins University; Ph.D. 1961, University of Maryland
- Ira David Godwin, *Assistant Clinical Professor of Pathology*
B.S. 1952, M.D. 1955, University of North Carolina at Chapel Hill
- Victor Karl Golla, *Assistant Professor of Anthropology*
B.A. 1960, University of California, Berkeley
- Cecil Earnest Goode, *Professorial Lecturer in Public Administration*
B.S., M.S. 1938, Purdue University
- Leonard Harold Goodman, *Professorial Lecturer in Sociology*
B.A. 1949, University of Connecticut; M.A. 1952, Ph.D. 1962, Columbia University
- Jacqueline Jarrett Goodnow, *Associate Professor of Psychology*
B.A. 1944, University of Sydney, Australia; Ph.D. 1952, Radcliffe College
- Bernard Gordon, *Professorial Lecturer in Political Science*
B.A. 1953, M.A. 1955, New York University; Ph.D. 1959, University of Chicago
- Francis Byron Gordon, *Professorial Lecturer in Microbiology (Virology)*
B.S. 1927, Illinois Wesleyan University; Ph.D. 1936, M.D. 1937, University of Chicago
- Marvin Gordon, *Associate Professor of Geography and Regional Science*
B.A. 1942, City College, New York; M.A. 1954, Ph.D. 1966, Columbia University
- Charles Mayo Goss, *Visiting Professor of Anatomy (Medical History)*
B.A. 1921, M.D. 1926, Yale University
- Wood Gray, *Professor of American History*
B.A. 1927, M.A. 1928, University of Illinois; Ph.D. 1933, University of Chicago
- Vernon Elmer Greaver, *Assistant Professorial Lecturer in Education*
B.A. 1951, M.A. 1953, M.A. in Ed. 1962, Ed.D. 1965, George Washington University
- Marvin David Green, *Associate Professor of Mathematics*
B.S. 1961, M.A. 1962, Ph.D. 1965, University of Cincinnati
- Sherwin Greene, *Assistant Professor of Urban Planning*
B.Arch. 1959, M.S. 1960, Illinois Institute of Technology
- Samuel Greenhouse, *Professorial Lecturer in Statistics*
B.S. 1938, City College, New York; M.A. 1954, Ph.D. 1959, George Washington University

Angus MacIvor Griffin, *Professor of Microbiology*

Ph.B. 1931, M.A. 1933, Ph.D. 1938, Brown University

Fuller Griffith, *Assistant Professor of Art (Graphics)*

B.S. 1952, University of Wisconsin; M.F.A. 1969, George Washington University

Lewis John Griffith, *Visiting Professor of Microbiology*

B.S. 1948, M.S. 1950, Ph.D. 1953, Ohio State University

*William Byron Griffith, *Associate Professor of Philosophy*

B.A. 1958, University of Notre Dame; M.A. 1962, Ph.D. 1963, Yale University

†Phillip Donald Grub, *Associate Professor of Business Administration*

B.A., B.A. in Ed. 1953, Eastern Washington State College; M.B.A. 1960, D.B.A. 1964, George Washington University

‡Francis Stanley Grubar, *Associate Professor of Art*

B.A. 1948, M.A. 1949, University of Maryland; M.A. 1952, Ph.D. 1966, Johns Hopkins University

Margaret Beltz Guenther, *Lecturer in German*

B.A. 1950, M.A. 1953, University of Kansas; Ph.D. 1958, Radcliffe College

Grace Hughes Guin, *Assistant Clinical Professor of Pathology*

B.S. 1938, Birmingham-Southern College; M.D. 1943, Vanderbilt University

Gordon Guroff, *Professorial Lecturer in Biochemistry*

B.S. 1954, University of Illinois; M.S. 1956, Auburn University; Ph.D. 1959, University of Wisconsin

Andrew Gyorgy, *Professor of Political Science and International Affairs*

B.A. 1937, J.D. 1938, University of Budapest, Hungary; M.A. 1939, University of California, Berkeley; Ph.D. 1943, University of California, Los Angeles

Sheldon Edward Haber, *Associate Professor of Economics*

B.A. 1954, City College, New York; Ph.D. 1958, Johns Hopkins University

Robert Arthur Hadley, *Assistant Professor of History*

B.A. 1959, Bowdoin College; M.A. 1960, Ph.D. 1964, University of Pennsylvania

Fred Latimer Hadsel, *Professorial Lecturer in Political Science*

B.A. 1937, Miami University; M.A. 1938, Clark University; Ph.D. 1942, University of Chicago

Richard William Hagauer, *Associate Professorial Lecturer in Business Administration*

B.A. 1959, M.S. in Per. Adm. 1966, George Washington University

William Archer Hagins, *Associate Professorial Lecturer in Physiology*

B.A. 1946, M.A. 1948, M.D. 1952, Stanford University; Ph.D. (Cantab.) 1958, Cambridge University, England

Fred Ernst Hahn, *Professorial Lecturer in Pharmacology*

Ph.D. 1948, University of Kiel, Germany

Gerald Anthony Hahn, *Assistant Research Professor of Pharmacology*

B.A. 1961, Bellarmine-Ursuline College; Ph.D. 1966, University of Louisville

Donald Frank Hall, *Lecturer in Special Education*

B.A. 1953, University of New Mexico; M.A. in Ed. 1967, Ed.S. 1969, George Washington University

Martin Samuel Halpern, *Assistant Professorial Lecturer in Religion*

B.A. 1957, American University

James Addison Halsted, *Professor of Epidemiology and Environmental Health (International Health)*

B.A. 1926, M.D. 1930, Harvard University

Lilien Filipovitch Hamilton, *Assistant Professor of Art*

B.A. 1962, M.A. 1965, George Washington University

* On sabbatical leave spring semester 1971.

† On sabbatical leave 1970-71.

‡ On sabbatical leave fall semester 1970-71.

- Suzanne Dorothy Schubert Hammersberg, *Assistant Professor of Pathology (Medical Technology)*
B.S. 1957, Wisconsin State University, La Crosse
- William Ambrose Hamrick, *Professor of Health Care Administration*
B.S. 1934, Oklahoma State University; M.A. 1950, American University; M.H.A. 1956, Baylor University; D.S.O. 1969, Illinois College of Optometry
- John Hanessian, Jr., *Associate Professorial Lecturer in Political Science*
B.S. 1947, Syracuse University
- Raymond George Hanken, *Professor of Physical Education*
B.S. in P.E. 1938, M.A. in Ed. 1952, George Washington University
- Ira Bowers Hansen, *Professor of Zoology*
B.S. 1928, M.A. 1929, Wesleyan University; Ph.D. 1932, University of Chicago
- Teruo Hara, *Studio Lecturer in Art (Ceramics)*
B.A. 1950, M.A. 1952, Tokyo Kyoiku University, Japan
- Norman Ross Harbaugh, *Assistant Professorial Lecturer in Business Administration*
B.S. 1950, Columbia University; M.A. 1951, Stanford University; M.B.A. 1955, D.B.A. 1965, Harvard University
- John Hardt, *Professorial Lecturer in Economics*
B.A. 1945, M.A. 1948, University of Washington; M.A. 1950, Ph.D. 1955, Columbia University
- Charles Stanley Harris, *Assistant Professor of Sociology*
B.A. 1963, Syracuse University; M.A. 1965, Ph.D. 1967, Duke University
- John May Harrison, *Assistant Professor of Physics*
B.S. 1929, M.S. 1939, Bucknell University
- Robert Frank Hartley, *Associate Professor of Business Administration*
B.B.A. 1949, Drake University; M.B.A. 1962, Ph.D. 1967, University of Minnesota
- Clarence Richard Hartman, *Associate Professor of Epidemiology and Environmental Health*
B.A. 1933, M.D. 1936, George Washington University
- William Leas Haskell, *Assistant Professorial Lecturer in Physiology*
B.S. 1960, University of California, Santa Barbara; M.S. 1963, Ph.D. 1965, University of Illinois
- Richard Catlin Haskett, *Professor of American History*
B.A. 1940, M.A. 1941, Indiana University; M.A. 1948, Ph.D. 1952, Princeton University
- Donald Hawkins, *Professorial Lecturer in Physical Education*
B.A. 1958, King's College, Pennsylvania; M.A. 1960, Lehigh University; Ed.D. 1967, New York University
- Joseph Ernest Hazel, *Associate Professorial Lecturer in Geology*
B.A. 1956, M.A. 1960, University of Missouri; Ph.D. 1963, Louisiana State University
- Dale Martin Heien, *Assistant Professorial Lecturer in Economics*
B.A. 1960, M.A. 1962, University of Illinois; Ph.D. 1968, George Washington University
- Dorothy Henderson Heilman, *Professorial Lecturer in Microbiology (Cellular Immunology)*
B.S. 1927, M.D. 1932, Northwestern University; M.S. 1940, University of Minnesota
- Beverly Anderson Heinle, *Associate Professorial Lecturer in Education*
B.S. in Art Ed. 1948, St. Cloud State College; Ed.M. 1950, University of Minnesota; Ed.D. 1967, George Washington University
- Elson Bowman Helwig, *Clinical Professor of Pathology (Dermatologic)*
B.S. 1930, M.D. 1932, Indiana University
- George Francis Henigan, *Professor of Speech; Director of Forensics*
B.A. 1936, Kearney State College; Ph.M. 1940, University of Wisconsin
- Dagmar Renate Kirshner Henney, *Associate Professor of Mathematics*
B.S. 1954, M.S. 1956, University of Miami; Ph.D. 1964, University of Maryland
- Charles Joseph Herber, *Associate Professor of European History*
B.A. 1952, Dickinson College; M.A. 1957, Ph.D. 1965, University of California, Berkeley

- Gilbert Herer, *Professorial Lecturer in Speech*
B.S. 1953, M.S. 1954, Syracuse University; Ph.D. 1964, Northwestern University
- Roy Herrmann, *Visiting Professor of Management Science*
B.S. 1920, College Francais, Germany; Dr.Pol.Sc. 1929, University of Rostock, Germany
- Norman Herz, *Professorial Lecturer in Geology*
B.S. 1943, City College, New York; Ph.D. 1950, Johns Hopkins University
- Carla Susan Raskin Heymsfeld, *Assistant Professorial Lecturer in Education*
B.A. 1962, Brandeis University; M.A. in Ed. 1967, George Washington University
- Julia Elizabeth Hicks, *Assistant Professor of Spanish*
B.A. 1946, M.A. 1947, University of Tennessee
- Philip Henry Highfill, Jr., *Professor of English*
B.A. 1942, Wake Forest University; M.A. 1948, Ph.D. 1950, University of North Carolina at Chapel Hill
- Peter Proal Hill, *Associate Professor of History*
B.A. 1949, Tufts University; M.A. 1954, Boston University; Ph.D. 1966, George Washington University
- James William Hillis, *Associate Professor of Speech; Director, Speech Pathology and Audiology*
B.S. 1952, University of Nebraska; M.A. 1957, University of Maryland; Ph.D. 1963, Ohio State University
- Alfred John Hildebeitel, *Assistant Professor of Religion*
B.A. 1963, Haverford College; M.A. 1966, University of Chicago
- Harold Clendenin Hinton, *Professor of Political Science and International Affairs*
B.A. 1946, M.A. 1948, Ph.D. 1951, Harvard University
- Herman Hedberg Hobbs, *Professor of Physics*
B.S. 1953, M.S. 1955, George Washington University; Ph.D. 1958, University of Virginia
- Cornelia Hoch-Ligeti, *Clinical Professor of Pathology*
M.D. 1931, University of Vienna, Austria
- John Bernard Holden, *Professorial Lecturer in Education*
B.S. 1932, Ohio University; M.A. 1936, Ph.D. 1955, Ohio State University
- Robert Lee Holland, *Associate Professor of Management Science*
B.S. 1951, M.S. 1956, University of Tennessee; Ph.D. 1960, Texas A&M University
- Mary Alida Holman, *Associate Professor of Economics*
B.A. 1955, M.A. 1957, Ph.D. 1963, George Washington University
- Robert William Holmstrom, *Visiting Assistant Professor of Psychology*
B.A. 1956, Trinity College, Connecticut; Ph.D. 1965, Duke University
- Samuel Holvey, *Studio Lecturer in Art (Design)*
B.F.A. 1957, Syracuse University
- William Duane Hope, *Adjunct Lecturer in Biological Sciences*
B.S. 1957, M.S. 1960, Colorado State University; Ph.D. 1964, University of California, Davis
- Waring Carrington Hopkins, *Professor of International Affairs, George Washington University Program, Naval War College, Newport, Rhode Island*
B.A. 1945, Duke University; Ph.D. 1949, University of Paris, France
- *Gloria Lyon Horrworth, *Assistant Professor of Education*
B.A. 1952, California State College at Los Angeles; M.A. 1961, San Fernando Valley State College
- Joseph Julian Horton, Jr., *Assistant Professorial Lecturer in Economics*
B.A. 1958, New Mexico State University; M.A. 1965, Ph.D. 1968, Southern Methodist University
- Nicholas Hotton, *Professorial Lecturer in Geology*
B.S. 1947, Ph.D. 1950, University of Chicago

* On leave of absence 1970-71.

- *John Candee Houck, *Professor of Pediatrics (Biochemistry)*
B.A. 1953, Columbia University; M.S. 1955, Ph.D. 1956, University of Western Ontario, Canada
- Barbara Viventi Howard, *Assistant Research Professor of Biochemistry*
B.A. 1963, Bryn Mawr College; Ph.D. 1968, University of Pennsylvania
- John Stewart Howe, *Associate Clinical Professor of Pathology*
B.A. 1928, University of South Dakota; M.D. 1932, Johns Hopkins University
- James Melton Howell, *Associate Professorial Lecturer in Economics*
B.A. 1956, Texas A&M University; Ph.D. 1963, Tulane University of Louisiana
- Jonathan Broome Howes, *Assistant Professorial Lecturer in Urban and Regional Planning*
B.A. 1959, Wittenberg University; M.R.P. 1961, University of North Carolina at Chapel Hill; M.P.A. 1966, Harvard University
- Anne Mildred Hoyle, *Assistant Professorial Lecturer in Education*
B.S. 1941, University of Maryland; M.A. 1946, Columbia University; A.P.C. 1961, George Washington University
- Tao-tai Hsia, *Professorial Lecturer in Law*
LL.B. 1945, National Cheng-chih University, China; LL.M. 1950, J.S.D. 1952, Yale University
- Ching-Yao Hsieh, *Associate Professor of Economics*
B.A. 1939, St. John's University, China; M.A. 1958, Ph.D. 1964, George Washington University
- Kun-yen Huang, *Assistant Professor of Microbiology*
M.D. 1959, National Taiwan University; Ph.D. 1967, George Washington University
- Rudolph Hugh, *Professor of Microbiology*
B.S. 1948, Michigan State University; Ph.D. 1954, Loyola University, Illinois
- Carlyle Darwin Hughes, *Associate Professor of Accounting*
B.A. in Bus.Adm. 1954, Washington State University; M.B.A. 1961, D.B.A. 1966, University of Washington
- Robert Lee Humphrey, Jr., *Assistant Professor of Anthropology*
B.A. 1962, American University
- William Roy Huntington, *Studio Lecturer in Applied Music (Clarinet, Recorder, and Saxophone)*
- Gérard Paul Huvé, *Assistant Professor of French*
B.A. 1963, American University; M.A. 1969, University of Maryland
- C. Terrence Ireland, *Associate Professor of Statistics*
B.A. 1960, Cornell University; Ph.D. 1967, George Washington University
- Nelson Sumner Irey, *Clinical Professor of Pathology*
B.S. 1935, M.D. 1938, University of Pittsburgh
- Norman Murray Irvine, *Studio Lecturer in Applied Music (Bass)*
B.S. in Mus.Ed. 1955, M.Ed. in Mus.Ed. 1962, University of Maryland
- Margaret Ives, *Professorial Lecturer in Psychology*
B.A. 1924, Vassar College; M.A. 1929, Ph.D. 1938, University of Michigan
- David Iwamoto, *Associate Professorial Lecturer in Education*
B.A. 1947, Walla Walla College; M.A. 1948, Columbia Union College; M.A. in Ed. 1952, Ed.D. 1963, George Washington University
- Michael John Jackson, *Assistant Professor of Physiology*
B.S. 1963, University of London, England; Ph.D. 1966, Sheffield University, England
- Terence George Jackson, Jr., *Professorial Lecturer in History*
B.S. 1948, University of Illinois; M.A. 1951, University of Chicago
- Elden Eugene Jacobson, *Professorial Lecturer in Sociology*
B.A. 1958, College of Idaho; B.D. 1961, Ph.D. 1966, Yale University
- William James Jaffurs, *Associate Clinical Professor of Pathology*
B.S. 1948, Pennsylvania State University; M.D. 1952, Jefferson Medical College of Philadelphia

* On sabbatical leave July 1 to November 30, 1970.

- Donald Richard Janis, *Lecturer in English*
B.A. 1955, M.A. 1963, Brown University
- Frank Skiff Jannotta, *Associate Professor of Pathology*
B.A. 1951, Williams College; M.D. 1955, University of Pennsylvania
- John Anderson Javens, *Lecturer in English*
B.A. 1958, Geneva College
- Herbert Jehle, *Professor of Physics*
Dr.Ing. 1933, Institute of Technology, Berlin
- Christopher Jehn, *Assistant Professor of Economics*
B.A. 1965, Beloit College
- Juri Jelagin, *Assistant Professorial Lecturer in Russian*
Mus.M. 1939, Moscow State Conservatory, Soviet Union
- Bruce George Jenkins, *Assistant Professorial Lecturer in Education*
B.A. 1942, Fairmont State College; M.A. 1950, West Virginia University
- Alvin Carl Jensen, *Associate Professorial Lecturer in Education*
Ed.B. 1958, Wisconsin State University, Whitewater; M.A. in Ed. 1960, Ed.D. 1967, George Washington University
- Martha Anne Jesnak, *Assistant Professorial Lecturer in Physical Education*
B.S. 1945, University of North Carolina at Greensboro; M.S. 1948, Pennsylvania State University
- Joe Lee Jessup, *Professor of Business Administration*
B.S. in B.A. 1936, University of Alabama; M.B.A. 1941, Harvard University; LL.D. 1964, University of Chungang, Korea
- Donald Jewell, *Associate Clinical Professor of Psychology*
B.A. 1954, University of Maryland; Ph.D. 1957, University of Denver
- Elvin Clement Johns, *Studio Lecturer in Applied Music (Guitar)*
Mus.B. 1964, Rollins College
- Eva Mayne Johnson, *Associate Professor of Psychology*
B.A. 1949, M.A. 1951, Ph.D. 1957, George Washington University
- Geraldine Niva Johnson, *Lecturer in English*
B.S. 1963, University of Minnesota, Duluth; M.A. 1966, University of California, Los Angeles
- Lent Clifton Johnson, *Special Lecturer in Pathology*
B.S. 1931, M.D. 1935, University of Chicago
- Nancy Diers Johnson, *Assistant Professor of Physical Education*
B.S. 1955, University of Minnesota; M.A. 1966, University of Iowa
- Robert Carl Johnson, *Lecturer in Biological Sciences*
B.A. 1965, Columbia University
- Thomas Nick Johnson, *Professor of Anatomy*
B.S. 1944, St. Ambrose College; M.S. 1949, Michigan State University; Ph.D. 1953, University of Michigan
- William Reid Johnson, *Associate Professor of History*
B.A. 1951, Oberlin College; M.A. 1955, Ph.D. 1961, University of Washington
- Wallace Roy Johnston, *Lecturer in Business Administration*
B.B.A. 1967, George Washington University
- Werner Robert Jondorf, *Associate Research Professor of Pharmacology*
B.S. 1950, University of Wales; Ph.D. 1956, University of London, England
- Meredith Leam Jones, *Adjunct Lecturer in Biological Sciences*
B.A. 1948, M.A. 1952, Ph.D. 1956, University of California, Berkeley
- Robert Gean Jones, *Professor of Religion; University Marshal*
B.A. 1947, Baylor University; B.D. 1950, M.A. 1957, Ph.D. 1959, Yale University
- David George Joroff, *Assistant Professorial Lecturer in Education*
B.S. in C.E. 1955, Polytechnic Institute of Brooklyn; M.S. 1958, University of Paris, France

- Chester Roy Julian, *Lecturer in Business Administration*
B.S. in C.E. 1961, Texas A&M University; M.C.E. 1964, Catholic University of America
- Robert Konrad Kahn, *Associate Professorial Lecturer in Psychology*
B.A. 1946, University of Pennsylvania; M.A. 1953, George Washington University; Ph.D. 1957, Pennsylvania State University
- Michael Anthony Kandel, *Assistant Professor of Slavic Languages and Literatures*
B.A. 1963, M.A. 1965, Indiana University
- Stephen Arnold Karp, *Associate Professor of Psychology*
B.A. 1949, Brooklyn College; M.A. 1952, New School for Social Research; Ph.D. 1962, New York University
- Edward Naim Kassira, *Assistant Professor of Epidemiology and Environmental Health*
M.B., Ch.B. 1959, University of Baghdad, Iraq; M.P.H. 1965, Johns Hopkins University; M.S. in Hygiene 1967, Harvard University
- Kenneth Casper Kates, *Professorial Lecturer in Zoology*
B.A. 1932, Bard College; M.A. 1934, Ph.D. 1937, Duke University
- Irving Katz, *Associate Professor of Mathematics*
B.S. 1956, Brooklyn College; M.A. 1958, Ohio State University; Ph.D. 1964, University of Maryland
- Leonard William Katz, *Instructor in Health Care Administration*
B.A. 1960, M.B.A. 1961, Dartmouth College
- Erle Galen Kauffman, *Adjunct Professor of Geology*
B.S. 1955, M.S. 1956, Ph.D. 1961, University of Michigan
- Samuel Kavruck, *Associate Professorial Lecturer in Education*
B.S. 1937, M.S. in Ed. 1939, City College, New York; M.A. in Govt. 1950, Ed.D. 1954, George Washington University
- Robert Adolph Kaye, *Professorial Lecturer in Business Administration*
B.A. in Govt. 1948, M.A. in Govt. 1950, D.B.A. 1961, George Washington University
- *John Whitefield Kendrick, *Professor of Economics*
B.A. 1937, M.A. 1939, University of North Carolina at Chapel Hill; Ph.D. 1955, George Washington University
- Richard Alec Kenney, *Professor of Physiology*
B.S. 1945, Ph.D. 1947, University of Birmingham, England
- Robert Wayne Kenny, *Associate Professor of History*
B.J. 1953, University of Texas at Austin; M.A. 1957, University of Minnesota; Ph.D. 1963, University of Chicago
- Stephen Gabriel Kent, *Assistant Professor of Pathology*
B.A. 1956, M.D. 1960, Case Western Reserve University
- Hewitt Kenyon, *Professor of Mathematics*
B.S. 1942, Ph.D. 1954, University of California, Berkeley
- Jackson Kelley Kern, *Adjunct Assistant Professor of Statistics*
B.A. 1938, Fairmont State College; M.B.A. 1954, Columbia University
- Roderick Patrick Kernan, *Visiting Associate Professor of Physiology*
Ph.D. 1956, D.Sc. 1964, National University of Ireland
- Norayr Krikor Khatcheressian, *Assistant Professor of Physics*
B.A. 1960, M.A. 1963, George Washington University; Ph.D. 1966, University of Virginia
- Porter Martin Kier, *Professorial Lecturer in Geology*
Ph.D. (Cantab.) 1954, Cambridge University, England
- Kwang Suh Kim, *Associate Research Professor of Pharmacology*
M.D. 1947, Seoul National University, Korea; M.S. 1949, Ph.D. 1952, University of Illinois

* On sabbatical leave fall semester 1970-71.

*James Cecil King, *Professor of German*

B.A. 1949, M.A. 1950, Ph.D. 1954, George Washington University

Virginia Randolph Kirkbride, *Associate Professor of Educational Psychology*

B.A. 1941, M.A. 1942, University of Nebraska; Ed.D. 1959, George Washington University

Arthur David Kirsch, *Associate Professor of Statistics*

B.A. 1955, George Washington University; M.S. 1956, Ph.D. 1957, Purdue University

Donald Chenoweth Kline, *Professor of Art*

B.Arch. 1927, George Washington University; M.F.A. 1951, Catholic University of America

Philip Klubes, *Assistant Research Professor of Pharmacology*

B.S. 1956, Queens College, New York; M.S. 1959, Ph.D. 1962, University of Minnesota

Jack Louis Knetsch, *Professor of Economics*

B.S. 1955, M.S. 1956, Michigan State University; M.P.A. 1959, Ph.D. 1963, Harvard University

*George Martin Koehl, *Professor of Physics*

B.A. 1931, University of North Carolina at Chapel Hill; M.A. 1933, George Washington University

Marilyn Jean Koering, *Assistant Professor of Anatomy*

B.A. 1960, College of St. Scholastica; M.S. 1963, Ph.D. 1967, University of Wisconsin

Jane Philbrick Kofler, *Lecturer in Art*

B.A. 1932, Wellesley College; B.F.A. 1936, Schools of the Art Institute of Chicago

Roman Kolkowicz, *Professorial Lecturer in International Affairs*

B.A. 1954, State University of New York at Buffalo; M.A. 1958, Ph.D. 1964, University of Chicago

Sheldon Bernard Kopp, *Associate Clinical Professor of Psychology*

B.A. 1949, New York University; M.A. 1957, Ph.D. 1960, New School for Social Research

Louis Sampson Kornicker, *Adjunct Lecturer in Biological Sciences*

B.S. 1941, B.S. 1942, University of Alabama; M.A. 1954, Ph.D. 1957, Columbia University

Robert Henry Kraft, *Studio Lecturer in Applied Music (Trombone)*

Mus.B. 1960, Eastman School of Music

Wolfgang Herbert Kraus, *Professor of Political Science and International Affairs*

Dr.Jur. 1929, University of Frankfurt, Germany; S.J.D. 1931, Harvard University

Ruth Marilyn Krulfeld, *Assistant Professor of Anthropology*

B.A. 1956, Brandeis University

Richard John Kubalak, *Assistant Professorial Lecturer in Education*

B.S. in Ed. 1951, State University of New York at Buffalo; M.A. 1953, Columbia University

Solomon Kullback, *Professor of Statistics*

B.S. 1927, City College, New York; M.A. 1929, Columbia University; Ph.D. 1934, George Washington University

Morton Kupperman, *Professorial Lecturer in Statistics*

B.S. 1938, City College, New York; M.A. 1950, Ph.D. 1957, George Washington University

Frederick Charles Kurtz, *Associate Professor of Accounting*

B.S. in Com. 1948, University of Virginia; M.B.A. 1949, University of Pennsylvania; C.P.A. 1952, State of Maryland

Sau-Wah Kwan, *Instructor in Pharmacology*

B.S. 1965, Ph.D. 1969, McGill University, Canada

Jerry Lake, *Studio Lecturer in Art (Photography)*

B.F.A. 1966, Virginia Commonwealth University; M.F.A. 1968, Ohio University

Marshall Edwin Landay, *Assistant Professor of Epidemiology and Environmental Health*

B.S. 1949, University of Pittsburgh; M.S. 1961, West Virginia University; Ph.D. 1965, Duke University

Harry Hill Landon, Jr., *Associate Professorial Lecturer in Physics*

B.S. 1944, M.S. 1948, Case Western Reserve University; Ph.D. 1950, Yale University

* On sabbatical leave spring semester-1971.

- Carl James Lange, *Adjunct Associate Professor of Psychology; Assistant Vice President for Research*
B.S. 1945, Duke University; M.S. 1948, Ph.D. 1951, University of Pittsburgh
- Leroy Lester Langley, *Special Lecturer in Physiology*
B.A. 1938, University of California, Los Angeles; M.A. 1939, Stanford University; Ph.D. 1942, Yale University
- Leonard Laster, *Professorial Lecturer in Physiology*
B.A. 1949, M.D. 1950, Harvard University
- John Francis Latimer, *Professor of Classics*
B.A. 1922, Litt.D. 1964, Mississippi College; M.A. 1926, University of Chicago; Ph.D. 1929, Yale University
- Geza Peter Lauter, *Associate Professor of Business Administration*
B.A. 1954, Institute for Foreign Languages, Hungary; B.A. 1962, M.B.A. 1964, Ph.D. 1968, University of California, Los Angeles
- Robert Alan Lavine, *Assistant Professor of Physiology*
B.S. 1962, Ph.D. 1969, University of Chicago
- *Thelma Z. Lavine, *Elton Professor of Philosophy*
B.A. 1936, Radcliffe College; M.A. 1937, Ph.D. 1939, Harvard University
- Agnes Goodloe Lawless, *Assistant Professorial Lecturer in Education*
B.A., B.Dip. in Ed. 1928, George Washington University
- Esther Christian Lawton, *Assistant Professorial Lecturer in French*
B.A. 1932, University of Rochester; M.A. 1942, George Washington University
- Hugh Linus LeBlanc, *Professor of Political Science and Public Affairs; Director, Programs in Public Affairs*
B.A. 1948, Louisiana State University; M.A. 1950, University of Tennessee; Ph.D. 1958, University of Chicago
- Davis Lin-chuan Lee, *Assistant Professor of Chinese*
B.S. 1955, Chung-Hsing University, Taiwan; M.S. 1959, University of Minnesota
- Myrna Pike Lee, *Assistant Professor of Mathematics*
B.A. 1957, Cornell University; M.S. 1959, Ph.D. 1962, University of Illinois
- Jack Lefkowitz, *Studio Lecturer in Art (Design)*
Diploma 1956, Cooper Union for the Advancement of Science and Art
- Marvin Seymour Legator, *Professorial Lecturer in Microbiology (Microbial Genetics)*
B.A., M.S. 1948, Ph.D. 1951, University of Illinois
- Wolfram Karl Legner, *Professor of German*
B.A. 1923, Harvard University; M.A. 1932, Ph.D. 1936, University of Pennsylvania
- Laurence Pereira Leite, *Professor of Art*
M.A. 1956, Ph.D. 1966, Johns Hopkins University
- Patricia Hilary Madoo Lengermann, *Assistant Professor of Sociology*
B.A. 1963, Oxford University, England; M.A. 1966, Ph.D. 1968, Cornell University
- Edwin Milton Lerner II, *Professorial Lecturer in Microbiology*
B.A. 1941, M.D. 1944, Harvard University
- Charles Ulysses Letourneau, *Professorial Lecturer in Health Care Administration*
B.A. 1932, Loyola University, Canada; M.D. 1937, B.C.L. 1948, McGill University, Canada; M.S. in H.A. 1951, Northwestern University
- Neil Ann Levine, *Assistant Professorial Lecturer in Classics*
B.A. 1963, Cornell University; M.A. 1965, Ph.D. 1968, Columbia University
- Sar Levitan, *Research Professor of Economics*
B.S.S. 1937, City College, New York; M.A. 1939, Ph.D. 1949, Columbia University
- Bernard Isaac Levy, *Professor of Psychology*
B.A. 1948, New York University; Ph.D. 1952, University of Rochester

*On sabbatical leave 1970-71.

Bert Levy, Lecturer in Statistics

B.S. 1952, District of Columbia Teachers College; M.Phil. 1970, George Washington University

Joseph Benjamin Levy, Professor of Chemistry

B.S. 1943, University of New Hampshire; M.S. 1945, Ph.D. 1948, Harvard University

Edwin Joseph Baughman Lewis, Professor of Accounting

B.A. 1938, University of Western Ontario, Canada; M.B.A. 1939, Northwestern University

Ralph Kepler Lewis, Associate Professor of Anthropology

B.A. 1934, Southwest Missouri State College; M.A. 1939, University of Southern California; Ph.D. 1967, Columbia University

Helena Keehne Lietwiler, Assistant Professorial Lecturer in Education

B.A. 1928, Western College for Women; M.A. 1956, Ed.D. 1967, George Washington University

***Hubert Whitman Lilliefors, Professor of Statistics**

B.A. 1952, Ph.D. 1964, George Washington University; M.A. 1953, Michigan State University

Carl Arne Linden, Associate Professorial Lecturer in Political Science

B.A. 1951, Syracuse University; M.A. 1956, Harvard University; Ph.D. 1966, George Washington University

Roy Charles Lindholm, Associate Professor of Geology

B.S. 1959, University of Michigan; M.A. 1963, University of Texas at Austin; Ph.D. 1967, Johns Hopkins University

Donald Linkowski, Assistant Professor of Education

B.A. 1961, M.S. 1963, Ph.D. 1969, State University of New York at Buffalo

Calvin Darlington Linton, Professor of English; Dean of Columbian College of Arts and Sciences

B.A. 1935, George Washington University; M.A. 1939, Ph.D. 1940, Johns Hopkins University

Gordon Leslie Lippitt, Professor of Behavioral Sciences

B.S. 1942, Springfield College; B.D. 1946, Yale University; M.A. 1947, University of Nebraska; Ph.D. 1959, American University

Arthur Ludwig Litke, Professorial Lecturer in Accounting

B.S. 1944, Trinity College, Connecticut; M.B.A. 1947, University of Pennsylvania; C.P.A. 1950, State of North Carolina

Thomas Phillip George Liverman, Professor of Mathematics

B.A. 1941, University of Montpellier, France; M.A. 1948, Ph.D. 1956, University of Pennsylvania

Arthur Hamilton Livermore, Professorial Lecturer in Education

B.A. 1940, Reed College; M.S. 1942, Ph.D. 1944, University of Rochester

Norma Laver Loeser, Adjunct Assistant Professor of Business Administration

B.A. 1958, M.B.A. 1967, George Washington University

John Mortimer Logsdon, Assistant Professor of Public Affairs and Political Science

B.S. 1960, Xavier University, Ohio; Ph.D. 1970, New York University

Ming-jean Cheng Loh, Assistant Professorial Lecturer in Chinese

B.A. 1959, M.A. 1962, National Taiwan University; M.A. 1967, Yale University

William Allen Lombardo, Studio Lecturer in Art (Painting)

B.F.A. 1967, Ohio University; M.F.A. 1969, University of Wisconsin

William Francis Edward Long, Associate Professor of Economics; Assistant Dean of the Graduate School of Arts and Sciences

B.A. 1946, M.A. 1947, Ph.D. 1967, George Washington University

Paul Michael LoRusso, Assistant Professorial Lecturer in Business Administration

B.S. 1964, Syracuse University; M.B.A. 1968, Florida State University

John Carl Lowe, Assistant Professor of Geography and Regional Science

B.A. 1958, M.A. 1960, George Washington University; Ph.D. 1969, Clark University

* On sabbatical leave fall semester 1970-71.

- Kathryn Wentzel Lumley, *Assistant Professorial Lecturer in Education*
B.S. 1950, Lock Haven State College; Ed.M. 1954, Pennsylvania State University
- Richard Ossman Lundquist, *Lecturer in Business Administration*
B.S. 1958, University of Pennsylvania; M.S. 1959, Columbia University
- Evelyn Gabai Lynch, *Instructor in English*
B.A. 1958, M.A. 1966, University of Michigan
- William Allan MacDonald, *Professor of Art and Archeology*
B.A. 1940, Oberlin College; M.A. 1942, Ph.D. 1943, Johns Hopkins University
- Walter Maciejewicz, *Studio Lecturer in Applied Music (Bassoon)*
Performer's Diploma 1941, Curtis Institute of Music
- Bela Maday, *Professorial Lecturer in International Affairs*
Ph.D. 1937, Pazmany University, Hungary
- Eugene Ross Magruder, *Associate Professor of Business Administration*
B.B.A. 1950, M.B.A. 1951, University of Texas at Austin; Ph.D. 1959, Ohio State University
- Mary Diane Majerus, *Assistant Professor of Speech*
B.A. 1963, M.A. 1965, University of Iowa
- William Everett Maloney, *Associate Professorial Lecturer in Geology*
B.S. 1950, M.S. 1951, George Washington University
- *Harold George Mandel, *Professor of Pharmacology*
B.S. 1944, Ph.D. 1949, Yale University
- Nancy Siegmeister Mandel, *Assistant Professorial Lecturer in Music*
B.A. 1964, Sarah Lawrence College; M.A. 1970, New York University
- Garth Leroy Mangum, *Research Professor of Economics*
B.S. 1956, Brigham Young University; M.P.A. 1958, Ph.D. 1960, Harvard University
- Charles Roy Mann, *Assistant Professor of Statistics*
B.S. 1961, Polytechnic Institute of Brooklyn; M.S. 1963, Michigan State University; Ph.D. 1969, University of Missouri
- Wallace Harper Mann, *Studio Lecturer in Applied Music (Flute)*
Mus.B. 1943, Eastman School of Music
- Nicholas Emmanuel Manos, *Assistant Professorial Lecturer in Epidemiology and Environmental Health*
B.A. 1938, University of California, Berkeley; M.A. 1942, University of California, Davis
- Leroy Harris Mantell, *Associate Professor of Management*
B.A. in Govt. 1942, M.A. 1945, D.B.A. 1959, George Washington University
- Joseph Bernard Margolin, *Associate Professorial Lecturer in Psychology*
B.A. 1942, Brooklyn College; M.A. 1947, George Washington University; Ph.D. 1954, New York University
- Anthony Marinaccio, *Professor of Education*
M.A. 1939, Ohio State University; Ph.D. 1949, Yale University; LL.D. 1961, Parsons College
- John Edwin Marlow, *Studio Lecturer in Applied Music (Guitar)*
B.A. 1963, American University
- William Laverne Marsh, *Associate Professor of Pathology*
B.S. 1942, Purdue University; M.D. 1946, State University of New York at Buffalo
- Vernon Edward Martens, *Associate Clinical Professor of Pathology*
B.S. 1935, M.D. 1937, St. Louis University
- David Hill Massie, *Lecturer in Geology*
- Anthony James Mastro, *Associate Professor of Accounting*
B.S. 1951, M.B.A. 1953, New York University; M.A. 1963, University of Notre Dame; C.P.A. 1955, State of New Jersey
- Mary Jean Matthews, *Professorial Lecturer in Pathology*
B.A. 1946, M.D. 1949, George Washington University

* On sabbatical leave 1970-71.

Paul Mazel, *Associate Professor of Pharmacology*

B.S. 1946, Virginia Commonwealth University Medical College of Virginia; M.S. 1955, Trinity University; Ph.D. 1960, Vanderbilt University

Guido Ettore Mazzeo, *Professor of Romance Languages*

B.A. 1936, City College, New York; M.A. 1938, Ph.D. 1961, Columbia University

George Edward McCandlish, *Associate Professor of English*

B.A. 1936, University of Washington; Ph.D. 1962, Harvard University

John Francis McCarthy, Jr., *Associate Professor of Business Administration*

B.A. 1936, Duquesne University; M.L. 1955, University of Pittsburgh

Muriel Hope McClanahan, *Associate Professor of English*

B.A. 1935, Colorado College; M.A. 1937, Ph.D. 1940, University of Pittsburgh

William Agnew McClelland, *Professorial Lecturer in Psychology*

B.A. 1941, Brown University; M.A. 1946, Ph.D. 1948, University of Minnesota

Kenneth Frederick McClure, *Professorial Lecturer on Commercial Law*

B.S. 1931, M.S. 1932, Wichita State University; LL.B. 1941, University of Maryland

William Edward McConville, *Associate Professorial Lecturer in Public Administration*

B.A. 1958, Michigan State University; M.A. 1963, George Washington University

Shirley Dickinson McCune, *Assistant Professorial Lecturer in Education*

B.S. 1957, Colorado State College; M.S.W. 1960, University of Denver; D.S.W. 1966, Catholic University of America

Bruce Jerald McDonald, *Professorial Lecturer in Mathematics*

B.A. 1950, Northland College; M.S. 1962, M.S. 1963, Ph.D. 1966, Florida State University

James Kenneth McDonald, *Associate Professor of International Affairs; Director, Foreign Affairs Intern Program*

B.A. 1954, Yale University; B.Litt. 1961, Oxford University, England

*Mabel Vierling McEwan, *Assistant Professor of Physical Education*

B.A. 1941, M.A. in Ed. 1967, George Washington University

Edwin McGowin, *Studio Lecturer in Art*

B.S. 1961, University of Southern Mississippi; M.A. 1964, University of Alabama

Dorn Charles McGrath, Jr., *Associate Professor of Urban Planning*

B.A. 1952, Dartmouth College; M.C.P. 1959, Harvard University

Margaret McIntyre, *Associate Professor of Education*

B.S. in Ed. 1939, State University of New York at Buffalo; M.A. 1944, Northwestern University; A.P.C. 1963, George Washington University

Ruth Blumenfeld McKay, *Professorial Lecturer in Anthropology*

B.A. 1954, Brooklyn College; M.A. 1961, Ph.D. 1965, University of Pennsylvania

Marian McNabb, *Studio Lecturer in Applied Music (Piano and Organ)*

Mus.B. 1930, University of Kansas; M.S. in Mus. 1949, Union Theological Seminary

Robert Emit McNelis, *Assistant Professorial Lecturer in Education*

B.S. 1954, West Chester State College; M.A. in Ed. 1961, Ed.D. 1968, George Washington University

James McPherson, *Instructor in Mathematics*

B.S. 1958, M.A. 1961, Pennsylvania State University

William Gerald Melson, *Associate Professorial Lecturer in Geology*

B.A. 1961, Johns Hopkins University; M.A. 1963, Ph.D. 1964, Princeton University

Malcolm Lee Meltzer, *Associate Professor of Psychology; Director, Graduate Training in Clinical Psychology*

B.A. 1951, Western Maryland College; M.A. 1954, Ph.D. 1957, Catholic University of America

Bernard Matthew Mergen, *Assistant Professor of American Civilization*

B.A. 1959, University of Nevada; M.A. 1960, Ph.D. 1968, University of Pennsylvania

* On leave of absence 1970-71.

- Jesse Eugene Merida, *Lecturer in Geology*
B.A. 1959, Wichita State University
- Howard Maxwell Merriman, *Professor of American Diplomatic History*
B.A. 1930, M.A. 1931, University of Cincinnati; M.A. 1932, Ph.D. 1937, Harvard University
- Walter Mertz, *Special Lecturer in Biochemistry (Inorganic Metabolism)*
M.D. 1951, University of Mainz, Germany
- Joseph Louis Métivier, Jr., *Associate Professor of Romance Languages; Assistant Dean of Columbian College of Arts and Sciences*
B.A. 1951, M.A. 1955, George Washington University
- Lothar Metzl, *Professorial Lecturer in International Affairs*
Dr.Jur. 1929, University of Vienna, Austria
- Franz Henry Michael, *Professor of International Affairs and Far Eastern History; Director, Institute for Sino-Soviet Studies*
Sinological Diploma 1930, University of Berlin, Germany; Referendar 1931, Dr.Jur. 1933, University of Freiburg, Germany
- Charles Robert Midkiff, Jr., *Lecturer in Chemistry*
B.S. 1963, George Washington University
- Jack William Millar, *Vivian Gill Professor of Epidemiology and Environmental Health*
B.A. 1945, Stanford University; M.D. 1947, George Washington University; M.P.H. 1951, M.S. in Hygiene and Tropical Medicine 1952, Harvard University
- Charles Henry Miller, *Assistant Professorial Lecturer in Epidemiology and Environmental Health*
B.S., M.D. 1949, University of Nebraska; M.P.H. 1963, University of Pittsburgh
- Frank Nelson Miller, Jr., *Professor of Pathology*
B.S. 1943, M.D. 1948, George Washington University
- Mary Fetler Miller, *Assistant Professor of Russian*
B.A. 1943, Northwestern University; M.A. 1966, University of Michigan
- Charles Milton, *Research Professor of Geology*
B.A. 1923, Iowa State University of Science and Technology; Ph.D. 1929, Johns Hopkins University
- John Kent Minichiello, *Assistant Professorial Lecturer in Mathematics*
B.S. 1963, M.S. 1964, Ph.D. 1968, George Washington University
- Fredrick Louis Minn, *Associate Professor of Chemistry*
B.A. 1957, Ph.D. 1963, University of Illinois
- Edward Joseph Mock, *Associate Professor of Business Finance*
B.S. 1955, King's College, Pennsylvania; M.A. 1957, Marquette University; Ph.D. 1964, Ohio State University
- Diana Roberts Molinari, *Studio Lecturer in Applied Music (Piano)*
Mus.B. 1968, Peabody Institute of the City of Baltimore; Mus.M. 1970, George Washington University
- Clarence Cowan Mondale, *Associate Professor of American Civilization*
B.A. 1947, Macalester College; M.A. 1954, Ph.D. 1960, University of Minnesota
- John Judson Monroe, *Assistant Professorial Lecturer in English*
B.A. 1933, Illinois College; M.A. 1938, University of Colorado
- Margaret Wheeler Montzka, *Assistant Professor of Physics*
B.A. 1929, M.A. 1931, George Washington University
- Dorothy Adele Moore, *Assistant Professor of Education*
B.A. 1954, University of Maryland; M.A. 1959, A.P.C. 1964, American University
- Robert Hamilton Moore, *Professor of English*
B.A. 1934, M.A. 1938, Indiana University; Ph.D. 1948, University of Illinois
- James Morgan, *Associate Professorial Lecturer in Education*
B.A. 1949, University of Maryland; M.S. 1953, Trinity University; Ed.D. 1962, Columbia University

- John Andrew Morgan, Jr., *Associate Professor of Political Science and Public Affairs*
B.A. 1957, Stetson University; M.A. 1959, Ph.D. 1963, Duke University
- Glenn Ellis Morris, *Associate Professorial Lecturer in Health Care Administration*
B.S. 1933, M.A. 1938, University of Illinois; M.S. in H.A. 1956, Northwestern University
- Mabel Elizabeth Inco Morris, *Assistant Professorial Lecturer in Mathematics*
B.A. 1923, University of Evansville; M.A. 1928, University of Chicago
- Edith Elizabeth Mortensen, *Professor of Zoology*
B.A. 1925, Carleton College; M.A. 1927, University of Minnesota; Ph.D. 1945, George Washington University
- Subramaniam Moryadas, *Assistant Professor of Geography and Regional Science*
B.A. 1953, University of Madras, India; M.A. 1963, University of Maryland
- James Norman Mosel, *Professor of Psychology*
B.A. 1940, Colgate University; M.A. 1941, Columbia University
- Charles Arthur Moser, *Associate Professor of Russian*
B.A. 1956, Yale University; M.A. 1958, Ph.D. 1962, Columbia University
- Charles Mudge, *Assistant Professor of French*
B.A. 1962, State of New York University at Albany; M.A. 1964, Indiana University
- Irwin Lynn Mueller, *Assistant Professorial Lecturer in Business Administration*
B.B.A. 1964, M.B.A. 1966, University of Cincinnati
- Robert Phillip Multhauf, *Professorial Lecturer in History*
B.S. 1941, Iowa State University of Science and Technology; M.A. 1950, Ph.D. 1953, University of California, Berkeley
- Sam Clark Munson, *Professor of Biology*
B.S. 1930, M.S. 1931, Mississippi State University; Ph.D. 1952, University of Maryland
- Gardner Murphy, *Visiting Professor of Psychology*
B.A. 1916, Yale University; M.A. 1917, Harvard University; Ph.D. 1923, Columbia University
- Joseph Patrick Murphy, *Professorial Lecturer in Business Administration*
B.A. 1949, LL.B. 1950, LL.M. 1952, George Washington University
- Leonard Nadler, *Associate Professor of Education*
B.B.A. 1948, M.S. 1950, City College, New York; Ed.D. 1962, Columbia University
- Charles Rudolph Naeser, *Professor of Chemistry*
B.S. 1931, University of Wisconsin; M.S. 1933, Ph.D. 1935, University of Illinois
- William Guy Nash, *Assistant Professor of Biology*
B.S. 1963, M.A. 1965, Ph.D. 1969, University of Michigan
- Honey Weinstein Nashman, *Assistant Professor of Physical Education*
B.S. 1956, New York University; M.S. 1957, Smith College
- *David Nelson, *Professor of Mathematics*
B.A. 1939, M.A. 1940, Ph.D. 1946, University of Wisconsin
- Phillip Gillard Nelson, *Associate Professorial Lecturer in Physiology*
M.D. 1956, Ph.D. 1957, University of Chicago
- William Newman, *Professor of Pathology*
B.A. 1941, University of Wisconsin; M.D. 1946, New York University
- Elizabeth Sutherland Neyman, *Assistant Professor of Spanish*
B.A. 1957, University of California, Berkeley; M.A. 1959, George Washington University
- Benjamin Nimer, *Professor of Political Science and International Affairs*
B.A. 1942, Ph.D. 1953, University of Chicago
- Robert Anthony Norris, *Studio Lecturer in Applied Music (Guitar)*
- Mary Elizabeth Norton, *Adjunct Assistant Professor of Classics*
B.A. 1935, M.A. 1938, University of Michigan

* On sabbatical leave 1970-71.

- Mary Agnes Nutting, *Assistant Professorial Lecturer in Latin*
B.A. 1926, M.A. 1929, University of Iowa
- Robert O'Connor, *Assistant Professorial Lecturer in Speech*
B.A. 1955, American University
- Peter Dean Olch, *Professorial Lecturer in Pathology (History of Medicine)*
B.A. 1951, Pomona College; M.D. 1955, Johns Hopkins University
- George Andrew Olkhovsky, *Assistant Professor of Russian*
B.A. 1956, M.A. 1957, University of Minnesota; Ph.D. 1968, Georgetown University
- Ramon Garcia Osuna, *Studio Lecturer in Art (Film Making)*
Ph.D. 1959, Villanova University
- Harvey Leon Ozer, *Professorial Lecturer in Biochemistry*
B.A. 1960, Harvard University; M.D. 1965, Stanford University
- Harry Robert Page, *Professor of Business Administration*
B.A. 1941, Michigan State University; M.B.A. 1950, Harvard University; Ph.D. 1966, American University
- Chei-Min Paik, *Associate Professor of Accounting*
B.B.A. 1957, University of Minnesota; M.B.A. 1959, University of California, Los Angeles; D.B.A. 1963, Harvard University
- Howard Erwin Paine, *Assistant Professorial Lecturer in Journalism*
B.A. 1950, American International College
- Parker Jay Palmer, *Associate Professorial Lecturer in Sociology*
B.A. 1961, Carleton College; M.A. 1964, University of California, Berkeley
- Richard Emery Palmer, *Associate Clinical Professor of Pathology*
B.A., M.D. 1944, George Washington University
- William Carleton Parke, *Assistant Professor of Physics*
B.S. 1963, Ph.D. 1967, George Washington University
- Kittie Fenley Parker, *Associate Professor of Botany*
B.A. 1930, M.A. 1932, University of California, Berkeley; Ph.D. 1946, University of Arizona
- William Axel Parker, *Associate Professorial Lecturer in Health Care Administration*
B.S. 1945, University of Illinois; M.P.H. 1950, University of California, Berkeley; M.B.A. 1962, George Washington University
- Dee Rich Parkinson, *Assistant Clinical Professor of Pathology*
M.D. 1943, George Washington University
- Robert Carleton Parlett, *Professor of Microbiology*
B.A. 1948, M.S. 1951, University of Arizona; Ph.D. 1956, M.D. 1958, Northwestern University
- Richard Parnas, *Studio Lecturer in Applied Music (Violin and Viola)*
- Robert Parris, *Associate Professor of Music*
B.S. in Mus.Ed. 1945, M.S. in Mus.Ed. 1946, University of Pennsylvania; B.S. in Mus.Comp. 1948, Juilliard School of Music
- Hugh Jones Parry, *Research Professor of Sociology*
B.A. 1937, Yale University; M.S. 1939, Columbia University; Ph.D. 1949, University of Southern California
- David Leo Pawson, *Adjunct Lecturer in Biological Sciences*
B.S. 1960, M.S. 1961, Ph.D. 1964, Victoria University, New Zealand
- F. Taylor Peck, *Visiting Professor of International Affairs, George Washington University Program, Naval War College, Newport, Rhode Island*
B.S. 1941, Spring Hill College; M.A. 1948, Ph.D. 1950, Georgetown University
- Thomas Martin Peery, *Professor of Pathology*
B.A. 1928, D.M.S. 1966, Newberry College; M.D. 1932, Medical College of South Carolina
- Richard Wyndon Perkins, *Assistant Professorial Lecturer in Accounting*
B.A. 1953, Brown University; LL.B. 1956, Yale University; M.B.A. 1963, George Washington University

- Jack Perlmutter, *Studio Lecturer in Art (Printmaking)*
- Theodore Peter Perros, *Professor of Chemistry*
B.S. 1946, M.S. 1949, Ph.D. 1952, George Washington University
- Henry Peskin, *Adjunct Assistant Professor of Economics*
B.A. 1959, Wesleyan University; Ph.D. 1965, Princeton University
- Wretha Lanore Petersen, *Assistant Professor of Special Education*
B.S. 1955, Ed.M. 1957, University of Maryland
- David Carl Peterson, *Associate Professorial Lecturer in Mathematics*
B.S. 1960, Illinois Institute of Technology; Ph.D. 1965, University of California, Berkeley
- Ruth Irene Peterson, *Assistant Professor of Education*
B.S. 1945, State University of New York at Buffalo; M.S. 1946, Syracuse University
- Vladimir Petrov, *Professor of International Affairs*
M.A. 1961, Ph.D. 1965, Yale University
- Carl Herman Pfuntner, *Associate Professor of Philosophy*
B.A. 1949, M.A. 1953, George Washington University; Ph.D. 1967, Georgetown University
- Marianne Ruth Phelps, *Assistant Professorial Lecturer in Education; Associate Dean of Students*
B.A. 1961, University of Michigan; M.S. 1964, M.A. 1965, University of Wisconsin
- Ewing Lakin Phillips, *Professor of Psychology; Director, Psychological Clinic*
B.S. 1937, Central Missouri State College; M.A. 1940, University of Missouri; Ph.D. 1949, University of Minnesota
- Robert Dale Phillips, *Assistant Professorial Lecturer in Statistics*
B.S. 1958, M.S. 1959, Oklahoma State University; Ph.D. 1969, George Washington University
- Jack Warren Pierce, *Adjunct Professor of Geology*
B.S. 1949, M.S. 1950, University of Illinois; Ph.D. 1964, University of Kansas
- Lois Irene Platt, *Associate Professor of Pathology (Cytology)*
B.A. 1931, Goucher College; M.D. 1946, University of Maryland
- Sidney Ploss, *Associate Research Professor of International Affairs*
B.A. 1953, Syracuse University; Ph.D. 1957, University of London, England
- Judith Ann Abrams Plotz, *Assistant Professor of English*
B.A. 1960, Radcliffe College; B.A. (Cantab.) 1962, M.A. (Cantab.) 1966, Cambridge University, England; Ph.D. 1965, Harvard University
- Richard James Podolsky, *Associate Professorial Lecturer in Physiology*
B.S. 1946, Ph.D. 1952, University of Chicago
- Ross Pollock, *Associate Professorial Lecturer in Public Administration*
B.S. 1930, Lafayette College; M.A. 1932, George Washington University
- Mary Winslow Poole, *Assistant Professorial Lecturer in Italian*
B.A. 1957, Newton College of the Sacred Heart; M.S.L. 1963, Georgetown University
- Nadine Nadeshda Popluiko-Natov, *Associate Professor of Russian*
M.A. 1939, Ph.D. 1941, Pedagogical Institute of Modern Languages, Soviet Union
- Ben Posner, *Professorial Lecturer in Public Administration*
B.S. 1936, University of Arizona; M.A. 1941, George Washington University; Ph.D. 1962, American University
- Carol Hoaglan Poston, *Lecturer in English*
B.A. 1965, Creighton University; M.A. 1966, University of Nebraska
- Joseph Raymond Potter, Jr., *Assistant Professorial Lecturer in Business Administration*
B.S. 1954, University of Maryland; M.B.A. 1963, Case Western Reserve University
- Leonard Beatric Pouliot, *Associate Professorial Lecturer in Public Administration*
B.A. 1949, Mexico City College; M.A. in Govt. 1962, George Washington University

- Francisco Prats, *Associate Professor of Physics*
Licenciado en Ciencias Fisico 1946, University of Madrid, Spain; Ph.D. 1958, University of Maryland
- Paul Jay Price, *Assistant Professorial Lecturer in Microbiology*
B.S. 1959, University of Maryland; M.S. 1961, Ph.D. 1964, George Washington University
- Floyd Douglas Prillaman, *Lecturer in Special Education*
B.S. 1953, Lincoln Memorial University; Ed.M. 1960, College of William and Mary
- Robert William Prouty, *Assistant Professor of Special Education*
B.S. 1960, State University of New York, College at Geneseo; M.S. 1961, Syracuse University
- Stephen Henry Prussing, *Director of Choral Groups*
B.A. 1945, Occidental College; Postgraduate Diploma 1948, Juilliard School of Music
- Maurice Pierre Pujol, *Professorial Lecturer in Accounting*
B.B.A. 1949, LL.B. 1956, Loyola University, Louisiana
- *Ralph Elliott Purcell, *Professor of Political Science and International Affairs*
B.A. 1940, Florida Southern College; M.A. 1941, Duke University; Ph.D. 1949, University of Wisconsin
- Lawrence Pyle, Jr., *Assistant Clinical Professor of Epidemiology and Environmental Health*
M.D. 1939, Duke University
- Jon Alrik Quitslund, *Assistant Professor of English*
B.A. 1961, Reed College; Ph.D. 1967, Princeton University
- Sonya Quitslund, *Assistant Professor of Religion*
B.A. 1958, Seattle University; M.A. 1964, Ph.D. 1967, Catholic University of America
- Herbert Rabin, *Associate Professorial Lecturer in Physics*
B.S. 1950, University of Wisconsin; M.S. 1951, University of Illinois; Ph.D. 1959, University of Maryland
- Bernice Therese Radovich, *Lecturer in Biological Sciences*
B.A. 1953, University of Kansas
- Roland Cloyd Raffaele, *Studio Lecturer in Applied Music (Guitar)*
- Samuel Edward Ramsay, *Studio Lecturer in Applied Music (French Horn)*
- Bernard Ramundo, *Professorial Lecturer in Law*
B.A. 1947, City College, New York; LL.B. 1949, M.A. 1957, Columbia University; Ph.D. 1966, American University
- Martha Norman Rashid, *Professor of Education*
Ed.B. 1949, State University of New York, College at Geneseo; M.A. 1951, Ph.D. 1955, University of Iowa
- Charles Bass Reed, *Assistant Professor of Education*
B.S. in P.E. 1963, M.A. in Ed. 1965, George Washington University
- John Palmer Reesing, Jr., *Professor of English*
B.A. 1941, Baylor University; M.A. 1942, Tulane University of Louisiana; Ph.D. 1954, Harvard University
- Philip Norman Reeves, *Assistant Professor of Health Care Administration*
M.B.A. 1959, University of Chicago; D.B.A. 1970, George Washington University
- John Francis Regan, *Associate Professorial Lecturer in Business Administration*
B.S. 1939, Harvard University; M.B.A. 1962, D.B.A. 1968, George Washington University
- Joan Roddy Regnell, *Assistant Professor of Speech*
B.A. 1954, M.A. 1960, George Washington University
- Harald Alfred Rehder, *Adjunct Lecturer in Biological Sciences*
B.A. 1929, Bowdoin College; M.A. 1933, Harvard University; Ph.D. 1934, George Washington University

* On sabbatical leave fall semester 1970-71.

Bernard Reich, *Associate Professor of Political Science and International Affairs*

B.A. 1961, City College, New York; M.A. 1963, Ph.D. 1964, University of Virginia

Melvin Reich, *Associate Professor of Microbiology*

B.S. 1953, City College, New York; M.S. 1957, Ph.D. 1960, Rutgers, the State University

George Henry Reifenshtein, *Clinical Professor of Pathology*

B.A. 1932, M.D. 1936, Syracuse University

Shirley Louise Renshaw, *Studio Lecturer in Applied Music (Piano)*

Mus.B. 1967, Oberlin College

William Martin Reynolds, *Associate Professor of Speech*

B.A. 1950, Wichita State University; M.A. 1957, Ph.D. 1960, University of Florida

Alice Houghton Rice, *Lecturer in English*

B.A. 1953, Wellesley College; M.A. 1963, Temple University

Charles Rice, *Associate Professor of Psychology*

B.S. 1954, Iowa State University of Science and Technology; Ph.D. 1959, Case Western Reserve University

Lois Compton Richards, *Lecturer in Speech*

B.A. 1959, M.A. 1961, George Washington University

Thomas Elsworth Richards, *Lecturer in Accounting*

B.B.A. 1965, George Washington University

Floyd Millard Riddick, *Professorial Lecturer in Political Science*

B.A. 1932, Ph.D. 1935, Duke University; M.A. 1932, Vanderbilt University

Thomas Francis Riley, *Assistant Professor of Business Administration, George Washington University Program (Tidewater Area Center), Fort Monroe, Virginia*

B.S. 1958, M.B.A. 1969, Xavier University; M.S. in Fin.Mgt. 1966, George Washington University

Olivia Burnett Rivers, *Lecturer in English*

B.A. 1941, Blue Mountain College; M.A. 1942, George Peabody College for Teachers

*James Willis Robb, *Professor of Romance Languages*

B.A. 1939, Colgate University; M.A. 1950, Middlebury College; Ph.D. 1958, Catholic University of America

Mary Louise Robbins, *Professor of Microbiology*

B.A. 1934, American University; M.A. 1940, Ph.D. 1944, George Washington University

Philip Robbins, *Associate Professor of Journalism*

B.A. 1952, Washington and Lee University; M.S. 1955, Columbia University

Donald Robinson, *Adjunct Associate Professor of Political Science*

B.A. 1958, M.A. 1959, Northwestern University; Ph.D. 1963, American University

Thomas Robert Robinson, *Lecturer in Economics*

B.A. in Govt. 1965, M.Phil. 1970, George Washington University

Alan Myron Rochlin, *Associate Clinical Professor of Psychology*

B.S. 1950, Rutgers, the State University; Ph.D. 1954, Duke University

†Mario Rodríguez, *Professor of Latin American History*

B.A. 1946, M.A. 1948, Ph.D. 1952, University of California, Berkeley

Senta Stephanie Rogers, *Lecturer in Chemistry*

B.A. 1945, Hunter College; M.S. 1948, Purdue University; Ph.D. 1967, George Washington University

Kenneth William Rollins, *Associate Professorial Lecturer in Education*

B.A. 1946, George Peabody College for Teachers; Ed.M. 1947, Ed.D. 1957, Harvard University

Daniel David Roman, *Professor of Management Science*

B.S., B.A. 1949, M.A. 1953, Ph.D. 1956, University of Southern California

* On sabbatical leave fall semester 1970-71.

† On sabbatical leave 1970-71.

- James Rudolph Roman, Jr., *Assistant Professor of Business Administration*
B.S. 1958, Bucknell University; M.B.A. 1960, University of Maryland
- Blake Smith Root, *Professor of Education; Assistant Dean of the School of Education*
B.S. 1927, Monmouth College, Illinois; M.A. 1931, University of Illinois; Ed.D. 1948, George Washington University
- Clyde Forrest Roper, *Adjunct Lecturer in Biological Sciences*
B.S. 1959, Transylvania College; M.S. 1962, Ph.D. 1967, University of Miami
- S. McKee Rosen, *Visiting Professor of Public Administration*
B.A. 1923, University of Minnesota; Ph.D. 1931, University of London, England
- Fredrica Lehrman Rosenberg, *Assistant Professor of English*
B.A. 1962, American University; M.A. 1965, University of Maryland; Ph.D. 1969, University of Virginia
- Joseph Rosewater, *Adjunct Lecturer in Biological Sciences*
B.S. 1950, M.S. 1956, University of New Hampshire; Ph.D. 1960, Harvard University
- Barbara Friedel Roth-Schechter, *Assistant Professor of Pharmacology*
B.S. in Phar. 1960, University of Erlangen, Germany; Ph.D. 1965, University of Chicago
- David Alton Rowley, *Assistant Professor of Chemistry*
B.S. 1963, M.S. 1964, State University of New York at Albany; Ph.D. 1968, University of Illinois
- Constance Adelaide Russell, *Studio Lecturer in Applied Music (Piano)*
- Alexander Russo, *Studio Lecturer in Art (Painting)*
B.F.A. 1958, Columbia University
- William Rutiser, *Lecturer in Statistics*
B.S. (Machine Computers) 1967, George Washington University
- Robert Clinton Rutledge, *Associate Professor of English; Assistant Dean of Columbian College of Arts and Sciences*
B.A. 1940, University of Virginia; M.A. 1957, Ph.D. 1966, George Washington University
- Howard Morley Sachar, *Professor of History*
B.A. 1947, Swarthmore College; M.A. 1950, Ph.D. 1953, Harvard University
- *Carol Ruth St. Cyr, *Professor of Education*
B.S. 1946, Willimantic State College; M.A. 1949, Trinity College, Connecticut; Ph.D. 1955, University of Michigan
- Victoria Kochurova Sandor, *Assistant Professorial Lecturer in Russian*
B.A. 1954, Moscow Institute of Foreign Languages, Soviet Union; M.A. 1962, Georgetown University
- Burton Malcolm Sapin, *Professor of International Affairs and Political Science; Dean of the School of Public and International Affairs*
B.A. 1945, M.A. 1947, Columbia University; Ph.D. 1953, Princeton University
- Clyde Bailey Sargent, *Professor of International Affairs, George Washington University Program, Naval War College, Newport, Rhode Island*
B.A. 1930, Denison University; M.A. 1932, Trinity College, Connecticut; M.A. 1946, College of Chinese Studies, Peiping, China; Ph.D. 1946, Columbia University
- Robert Sauer, *Clinical Professor of Pathology (Comparative)*
D.V.M. 1952, University of Pennsylvania
- Evelyn Scales, *Instructor in Education*
B.S. 1957, Winston-Salem State College; M.A. 1968, Columbia University
- Arnold Schaefer, *Professorial Lecturer in Biochemistry*
B.S. 1939, South Dakota State University; M.S. 1941, Ph.D. 1947, University of Wisconsin
- Gretchen Voitel Scharf, *Studio Lecturer in Applied Music (Guitar)*
- Alan Neil Schechter, *Professorial Lecturer in Biochemistry*
B.A. 1959, Cornell University; M.D. 1963, Columbia University

* On sabbatical leave spring semester 1971.

- Nancy Wilson Schick, *Lecturer in English*
B.A. 1958, Augustana College, Illinois; M.A. 1963, George Washington University
- Stefan Otto Schiff, *Associate Professor of Zoology*
B.S. 1952, Roanoke College; Ph.D. 1964, University of Tennessee
- Richard Harold Schlagel, *Professor of Philosophy*
B.S. 1949, Springfield College; M.A. 1952, Ph.D. 1955, Boston University
- William Edward Schmidt, *Professor of Chemistry*
B.S. 1943, M.S. 1950, George Washington University; M.A., Ph.D. 1953, Princeton University
- Anne-Marie Pfister Schmutz, *Instructor in French*
Licence ès lettres 1957, University of Geneva, Switzerland
- Berthold Schmutzhart, *Studio Lecturer in Art (Drawing)*
- Laura Mues Schrenk, *Associate Professorial Lecturer in Philosophy*
Ph.D. 1963, University of Tübingen, Germany
- Maurice Herbert Schwartz, *Professorial Lecturer in Management Science*
B.A. 1941, University of Illinois
- Milton Allan Schwartz, *Associate Professorial Lecturer in Statistics*
B.S. 1938, City College, New York
- Abraham Schwebel, *Associate Professorial Lecturer in Chemistry*
B.S. 1935, M.S. 1938, Brooklyn College; Ph.D. 1958, University of Maryland
- Lois Katherine Green Schwoerer, *Associate Professor of History*
B.A. 1949, Smith College; M.A. 1952, Ph.D. 1956, Byrn Mawr College
- William Randolph Scott, *Assistant Professorial Lecturer in Physical Education*
B.A. 1957, Marshall University
- Norman Orville Scribner, Jr., *Assistant Professorial Lecturer in Music (Organ)*
Mus.B. 1961, Peabody Institute of the City of Baltimore
- Robert Curtis Sedwick, *Associate Professor of Business Administration; Director, George Washington University Program (Tidewater Area Center), Fort Monroe, Virginia*
B.S.E. 1949, U.S. Coast Guard Academy; M.E.A. 1960, D.B.A. 1964, George Washington University
- Lothar George Seeger, *Associate Professor of German*
B.A. 1954, Susquehanna University; B.D. 1957, Lutheran Theological Seminary, Philadelphia; M.A. 1962, Ph.D. 1966, University of Pennsylvania
- Aaron Bear Seidman, *Associate Professorial Lecturer in Hebrew*
B.A. 1941, Rabbi 1946, Yeshiva University; M.A. 1944, New York University
- Arthur Settel, *Assistant Professorial Lecturer in Journalism*
B.Lit. 1932, Columbia University
- Robert Poindexter Sharkey, *Professor of Economic History*
B.A. 1948, Princeton University; Ph.D. 1958, Johns Hopkins University
- Thomas Elliott Shaughnessy, *Associate Professor of Business and Public Administration, George Washington University Program (Tidewater Area Center), Fort Monroe, Virginia*
B.S. 1933, Massachusetts Institute of Technology; M.A. in Ed. 1948, George Washington University; Ed.D. 1957, Johns Hopkins University
- Stanley Newton Sherman, *Assistant Professor of Business Administration*
B.A. 1952, M.B.A. 1960, University of Maryland
- Chung-wen Shih, *Associate Professor of Chinese*
B.A. 1945, St. John's University, China; M.A. 1949, Ph.D. 1955, Duke University
- Walter Allen Shropshire, Jr., *Associate Professorial Lecturer in Botany*
B.S. 1954, M.S. 1956, Ph.D. 1958, George Washington University
- Eugene Joseph Shuchart, *Assistant Professorial Lecturer in Accounting*
B.S. 1950, Villanova University; M.B.A. 1951, University of Pennsylvania; C.P.A. 1956, State of Virginia

- Robert Hermann Shumway, *Associate Professor of Statistics*
B.A. 1958, Carleton College; M.S. 1960, Iowa State University of Science and Technology;
Ph.D. 1965, George Washington University
- Gordon Arthur Shunk, *Associate Professorial Lecturer in Urban and Regional Planning*
B.A. 1961, DePauw University; B.S. in C.E. 1961, M.S. in C.E. 1962, Ph.D. 1968, Purdue University
- Michelle Siteman Shwartz, *Lecturer in English*
B.A. 1965, University of Chicago; M.A.T. 1966, Yale University
- Sally Annette Sibley, *Assistant Research Professor of Psychology*
B.A. 1962, Winthrop College; M.S. 1964, Ph.D. 1966, Florida State University
- Barbara Ann Sickles, *Lecturer in Biological Sciences*
B.S. 1965, Cornell University
- *Frederic Richard Siegel, *Professor of Geochemistry*
B.A. 1954, Harvard University; M.S. 1958, Ph.D. 1961, University of Kansas
- Robert Sumner Sigafos, *Associate Professorial Lecturer in Botany*
B.S. 1942, M.S. 1943, Ohio State University; M.A. 1949, Ph.D. 1951, Harvard University
- Walter Wallace Sikes, *Associate Clinical Professor of Psychology*
B.A. 1949, Oberlin College; M.S. 1963, Ph.D. 1964, Purdue University
- David Elliot Silber, *Associate Professor of Psychology*
B.A. 1958, Wayne State University; M.A. 1960, Ohio University; Ph.D. 1965, University of Michigan
- Suzanne Lee Simons, *Assistant Professor of Anthropology*
B.A. 1948, Ohio State University; M.A. 1964, Ph.D. 1969, University of New Mexico
- Daniel Sinick, *Professor of Education*
B.A. 1936, City College, New York; M.A. 1937, State University of New York at Albany;
Ph.D. 1955, New York University
- Benjamin Williams Smith, *Professor of Biochemistry*
B.S. 1940, Virginia Polytechnic Institute; M.S. 1947, Ph.D. 1951, George Washington University
- James Cecil Smith, Jr., *Special Lecturer in Biochemistry*
B.S. 1956, M.S. 1959, Ph.D. 1964, University of Maryland
- John Chandler Smith, *Professor of Pathology*
B.S. 1941, M.D. 1944, University of Oregon
- Lowell Cyrus Smith, *Assistant Professor of Business Administration*
B.S. in B.A. 1953, Kent State University; M.B.A. 1963, George Washington University; Ph.D. 1969, University of Alabama
- Lyman Bradford Smith, *Professorial Lecturer in Botany*
B.A. 1925, M.A. 1928, Ph.D. 1930, Harvard University
- Stanley Sherrel Smith, *Lecturer in Psychology*
B.A. 1962, George Washington University
- Thomas Russell Smith, *Associate Professorial Lecturer in Journalism*
B.J. 1952, University of Missouri
- Walton Edward Smith, *Assistant Professor of Management*
B.S. 1960, M.S. 1962, University of Missouri
- William Arthur Smith, *Associate Professor of Mathematics*
B.A. 1941, M.A. 1947, Syracuse University
- John Michael Smothers, *Assistant Clinical Professor of Psychology*
B.A., M.A. 1955, Ph.D. 1961, University of Chicago
- Jeanne Ellen Snodgrass, *Associate Professor of Physical Education*
B.A. 1952, Ohio Wesleyan University; M.S. in P.E. 1953, Smith College
- Israel Gregory Sohn, *Adjunct Professor of Geology*
B.S. 1935, City College, New York; M.A. 1938, Columbia University; Ph.D. 1965, Hebrew University, Jerusalem

* On sabbatical leave spring semester 1971.

Henry Solomon, *Professor of Economics*

B.A. 1949, Brooklyn College; M.A. 1950, Ph.D. 1959, New York University

Waldo Sommers, *Professor of Public Administration*

B.A. 1927, Heidelberg College; M.A. 1934, Ph.D. 1948, Yale University

John David Spevacek, *Lecturer in Sociology*

B.A. 1960, M.A. 1964, University of Iowa

Paul Eppley Spiegler, *Assistant Professorial Lecturer in Biological Sciences*

B.S. 1956, University of Maryland; M.A. 1959, George Washington University

Mimi Spielberg, *Associate Clinical Professor of Psychology*

B.A. 1947, M.A. 1949, Ph.D. 1953, University of Nebraska

Robert Murry Stackhouse, *Studio Lecturer in Art (Painting)*

*Loretta May Stallings, *Professor of Physical Education; Director, Women's Athletics*

B.A. 1947, Stanford University; M.A. 1950, University of the Pacific; Ed.D. 1965, University of Texas at Austin

George Stambuk, *Professor of International Affairs, George Washington University Program, Naval War College, Newport, Rhode Island*

Abs.Jur. 1943, University of Zagreb, Yugoslavia; M.A. 1956, Ph.D. 1961, Indiana University

E. Percil Stanford, *Associate Professorial Lecturer in Health Care Administration*

B.A. 1961, Morgan State College; M.S. 1967, Ph.D. 1968, Iowa State University of Science and Technology

Selig Starr, *Associate Professorial Lecturer in Statistics*

B.A. 1940, Brooklyn College; M.A. 1951, Ph.D. 1962, George Washington University

Edward Steers, Jr., *Professorial Lecturer in Biochemistry*

B.S. 1959, Ph.D. 1963, University of Pennsylvania

Carl Steiner, *Associate Professor of German*

B.A. 1958, M.A. 1962, Ph.D. 1966, George Washington University

George Steiner, *Associate Professor of Music; Director of Orchestra*

B.S. 1938, Johns Hopkins University; Mus.B. 1938, Mus.M. 1940, Peabody Institute of the City of Baltimore

Carl Herbert Stem, *Assistant Professorial Lecturer in Economics*

B.A. 1957, Vanderbilt University; M.A. 1960, Ph.D. 1969, Harvard University

John Dallas Stempel, *Assistant Professorial Lecturer in Political Science*

B.A. 1960, Princeton University; M.A. 1963, Ph.D. 1965, University of California, Berkeley

Christopher Willie Sten, *Instructor in English*

B.A. 1966, Carleton College; M.A. 1968, Indiana University

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M.A. 1938, Pedagogical Institute, Poltava, Soviet Union; M.A. 1963, Syracuse University

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Mus.B. 1951, Mus.M. 1962, Catholic University of America

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B.A. 1951, Franklin and Marshall College; M.A. 1953, Ph.D. 1956, University of North Carolina at Chapel Hill

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B.A. 1946, M.A. 1948, Ph.D. 1954, George Washington University

Phyllis Langton Stewart, *Assistant Professor of Sociology*

B.A. 1961, M.A. 1962, California State College at Los Angeles; Ph.D. 1968, University of California, Los Angeles

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- Robert Gordon Stewart, *Assistant Professorial Lecturer in Art*
B.F.A. 1954, University of Pennsylvania
- Eugene Almon Stone, *Assistant Professor of Mathematics*
B.A. 1960, Vanderbilt University; Ph.D. 1966, University of Virginia
- Joseph Novak Stonesifer, *Associate Professor of Business Administration,
George Washington University Program (Tidewater Area Center), Fort
Monroe, Virginia*
B.S. 1936, University of Illinois; M.A. 1946, George Washington University
- Keith Larry Storrs, *Instructor in Political Science*
B.A. 1962, Brigham Young University
- Hiram Miller Stout, *Professor of International Affairs and Political Science;
Director, George Washington University Program, Naval War College,
Newport, Rhode Island*
B.A. 1926, DePauw University; M.A. 1931, Ph.D. 1934, Harvard University
- James Ashley Straw, *Associate Professor of Pharmacology*
B.S. 1958, Ph.D. 1963, University of Florida
- *Karl Ernest Stromsem, *Professor of Public Administration*
B.A. 1930, Pomona College; Ph.D. 1935, University of California, Berkeley
- Margaret Sue Sullivan, *Assistant Professor of English*
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- Rafael Supervia, *Professor of Spanish*
Doctor en derecho 1927, Universities of Valencia and Madrid, Spain
- Jeffrey Charles Susbauer, *Associate Professorial Lecturer in Business Adminis-
tration*
B.C.S. 1964, Seattle University; M.B.A. 1966, Indiana University; Ph.D. 1969, University of
Texas at Austin
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B.S. 1942, University of Illinois; M.A. 1943, Ph.D. 1945, Harvard University
- Choy Tak Taam, *Professor of Mathematics*
B.S. 1942, University of Illinois; M.A. 1943, Ph.D. 1945, Harvard University
- Roland Henry Tanck, *Associate Research Professor of Psychology*
B.A. 1939, University of Wisconsin; M.A. 1948, Ph.D. 1956, George Washington University
- Joseph Taney, *Studio Lecturer in Art (Advertising Design)*
Marvin Jacob Taves, *Professorial Lecturer in Health Care Administration*
B.A. 1945, Hamline University; Th.M. 1945, B.D. 1947, Bethel College and Seminary; M.A.
1952, Ph.D. 1954, University of Minnesota
- Thomas Clinton Teeple, *Lecturer in Statistics*
B.S. 1966, George Washington University
- Geza Teleki, *Professor of Geology*
Ph.D. 1936, University of Vienna, Austria
- Ira Rockwood Telford, *Professor of Anatomy*
B.A. 1931, M.A. 1933, University of Utah; Ph.D. 1942, George Washington University
- Douglas Harold Teller, *Associate Professor of Art*
B.A. 1956, Western Michigan University; M.F.A. 1962, George Washington University
- Ralph Raymond Temple, *Professorial Lecturer in Public Administration*
B.A. 1927, City College, New York; J.D. 1930, M.A. 1940, Ph.D. 1942, New York University
- Klaus Thoenelt, *Associate Professor of German*
Staatsexamen 1956, Ph.D. 1961, University of Freiburg, Germany
- Raymond Edward Thomas, *Assistant Professor of Statistics; Director, Univer-
sity Computer Center*
B.A. 1955, M.A. 1957, George Washington University
- Irene Thompson, *Assistant Professor of Russian*
B.S. 1965, M.S. 1969, Georgetown University

* On sabbatical leave fall semester 1970-71.

- James Lengerd Thompson, Jr., *Assistant Professor of Accounting*
B.B.A. 1931, Texas Christian University; M.B.A. 1936, University of Texas at Austin; LL.B. 1940, Georgetown University; C.P.A. 1953, State of Texas
- Ronald Bettes Thompson, *Professor of European History*
B.A. 1935, Yale University; Ph.D. 1954, University of Chicago
- William Dove Thompson, *Professorial Lecturer in Physical Education*
B.A. 1930, M.A. 1935, George Washington University; Ed.D. 1941, New York University
- Richard Thornton, *Associate Professor of History*
B.A. 1961, Colgate University; Ph.D. 1966, University of Washington
- William Robert Throckmorton, *Assistant Professorial Lecturer in Sociology*
B.A. 1954, George Washington University
- *Charles Stanley Tidball, *Henry D. Fry Professor of Physiology*
B.A. 1950, Wesleyan University; M.S. 1952, University of Rochester; Ph.D. 1955, University of Wisconsin; M.D. 1958, University of Chicago
- Mary Elizabeth Tidball, *Research Professor of Physiology*
B.A. 1951, Mount Holyoke College; M.S. 1955, Ph.D. 1959, University of Wisconsin
- Leslie Charles Tihany, *Professorial Lecturer in International Affairs*
B.S. 1931, Franklin and Marshall College; M.A. 1933, Ph.D. 1936, Northwestern University; M.A. 1938, Harvard University; Ph.D. 1943, University of Chicago
- Neil Avrill Tilkens, *Assistant Professor of Music*
Mus.B. 1950, Columbia Union College; Mus.M. 1952, Philadelphia Conservatory of Music
- Rodney Tillman, *Professor of Education; Dean of the School of Education*
B.A. 1943, Henderson State Teachers College; M.A. 1949, Ed.D. 1955, Columbia University
- Barbara Mills Timberlake, *Lecturer in Biological Sciences*
B.S. 1952, George Washington University; M.A. 1955, Amherst College
- Edwin Timbers, *Professor of Management*
B.A. 1944, West Virginia University; M.A. 1951, Ph.D. 1954, University of Michigan
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Mus.B. 1931, Mus.M. 1936, Eastman School of Music
- William George Torpey, *Professorial Lecturer in Public Administration*
B.A., M.A. 1935, State University of New York at Albany; Ph.D. 1941, New York University
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- Joseph Louis Tropea, *Assistant Professor of Sociology*
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B.A. 1948, Western Michigan University; M.S. 1950, University of Chicago
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- Stanley Holmes Turner, *Associate Professorial Lecturer in Sociology*
B.S. 1951, Temple University; M.A. 1958, University of Pennsylvania
- William Lewis Turner, *Associate Professor of English*
B.A. 1934, M.A. 1941, Ph.D. 1952, University of Pennsylvania
- Curtis Edward Tuthill, *Associate Professor of Psychology*
B.A. 1935, Macalester College; M.A. 1936, Ph.D. 1939, University of Iowa
- James Twitty, *Studio Lecturer in Art (Painting)*

* On sabbatical leave fall semester 1970-71.

- Julius Earl Uhlaner, *Professorial Lecturer in Psychology*
B.S. 1938, City College, New York; M.S. 1941, Iowa State University of Science and Technology; Ph.D. 1947, New York University
- George Vartkes Vahouny, *Professor of Biochemistry*
B.S. 1953, M.S. 1955, Ph.D. 1958, George Washington University
- Merle Glenn Van Dyke, *Assistant Professor of Special Education*
B.A. 1957, Calvin College; M.A. 1958, Michigan State University
- Jerry Donald Vedvik, *Associate Professor of French*
B.A. 1958, University of Wisconsin; M.A. 1962, Ph.D. 1965, University of Missouri
- Emanuel Vegh, *Associate Professorial Lecturer in Mathematics*
B.A. 1958, M.A. 1960, University of Delaware; Ph.D. 1965, University of North Carolina at Chapel Hill
- Robert Corbin Vincent, *Professor of Chemistry*
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- Vera Elena Vinogradoff, *Lecturer in Special Education*
B.A. 1966, Goucher College; M.A. in Ed. 1968, George Washington University
- John Vinyard, Jr., *Assistant Clinical Professor of Epidemiology and Environmental Health*
B.S. 1949, M.S. 1950, University of Missouri; M.P.H. 1953, University of California, Berkeley
- Clemmont Eyvind Vontress, *Associate Professor of Education*
B.A. 1952, Kentucky State College; M.S. 1956, Ph.D. 1965, Indiana University
- Mary Sanders Walden, *Instructor in English*
B.A. 1950, M.A. 1965, George Washington University
- Jack Wright Waldrip, *Assistant Professor of Management*
B.A. 1951, M.A. 1953, University of Tennessee
- Richard David Walk, *Professor of Psychology*
B.A. 1942, Princeton University; M.A. 1947, University of Iowa; M.A. 1949, Ph.D. 1951, Harvard University
- Glenn Walker, *Assistant Professor of Biochemistry*
B.A. 1958, Bellarmine-Ursuline College; Ph.D. 1963, Michigan State University
- LuVerne Crabtree Walker, *Associate Professorial Lecturer in Education*
B.A., B.Dip. in Ed. 1924, M.A. 1932, George Washington University
- Robert Harris Walker, Jr., *Professor of American Civilization*
B.S. 1945, Northwestern University; M.A. 1950, Columbia University; Ph.D. 1955, University of Pennsylvania
- Van Curtis Wall, Jr., *Lecturer in English*
B.A. 1961, M.A. 1964, University of Richmond
- *Dewey Wallace, Jr., *Associate Professor of Religion*
B.A. 1957, Whitworth College; B.D. 1960, Princeton Theological Seminary; M.A. 1962, Ph.D. 1965, Princeton University
- George Ching Yuan Wang, *Assistant Professor of Chinese*
B.A. 1951, Taiwan Normal University, Republic of China; M.S. 1955, Tokyo University of Education, Japan
- Thomas Howard Wardlow, *Studio Lecturer in Applied Music (Percussion Instruments)*
B.S. 1962, M.S. 1964, University of Illinois
- Martha Lou Ware, *Associate Professorial Lecturer in Education*
B.A. 1951, LL.B. 1953, University of Texas at Austin; M.A. in Ed. 1961, George Washington University
- Donald Stevenson Watson, *Professor of Economics*
B.A. 1930, University of British Columbia; Ph.D. 1935, University of California, Berkeley
- Stephen Jay Wayne, *Assistant Professor of Political Science*
B.A. 1961, University of Rochester; M.A. 1963, Ph.D. 1968, Columbia University

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- Diane Judith Downs Weber, *Instructor in English*
B.A. 1960, Denison University; M.A. 1961, University of Michigan
- Morris Aaron Weinberger, *Assistant Clinical Professor of Pathology*
B.S. 1942, M.D. 1946, Tufts University
- Robert Louis Weintraub, *Professor of Botany*
B.S. 1931, M.A. 1933, Ph.D. 1938, George Washington University
- Edward Ronald Weismiller, *Professor of English*
B.A. 1938, Litt.D. 1953, Cornell College, Iowa; M.A. 1942, Harvard University; D. Phil. (Oxon.) 1950, Oxford University, England
- William Gaynor Wells, Jr., *Associate Professorial Lecturer in Business Administration*
B.S. 1947, University of Chicago; M.S. 1961, Purdue University
- Harvey Robert Wertlieb, *Assistant Professorial Lecturer in Health Care Administration*
B.A. 1961, M.B.A. 1964, George Washington University
- David Gover White, *Professor of Chemistry*
B.Ch.E. 1950, Cornell University; Ph.D. 1954, Harvard University
- Ralph Kirby White, *Professor of Social Psychology*
B.A. 1929, Wesleyan University; Ph.D. 1937, Stanford University
- Richard Otis White, *Studio Lecturer in Music (Oboe)*
Mus.B. 1950, Eastman School of Music
- Garland Dean Wiggs, *Instructor in Education*
B.B.A. 1956, University of Cincinnati; M.A. 1960, Colorado State College
- Kurt Wilk, *Visiting Professor of International Affairs, George Washington University Program, Naval War College, Newport, Rhode Island*
J.U.D. 1932, University of Berlin, Germany; J.D. 1942, New York University
- Alfred Burton Willcox, *Professorial Lecturer in Mathematics*
B.A. 1947, M.A. 1949, Ph.D. 1953, Yale University
- Marjorie Joan Williams, *Assistant Clinical Professor of Pathology*
M.D. 1943, University of Bristol, England
- Robert Crumpton Willson, *Associate Professor of Journalism*
B.A. 1951, George Washington University
- Lawrence Winkler, *Assistant Professor of Education; Assistant Dean of the Summer Sessions*
B.S. 1952, M.A. 1954, Washington University; Ed.D. 1965, George Washington University
- Theodore Winship, *Associate Clinical Professor of Pathology*
B.A. 1931, M.D. 1937, University of Nebraska
- Erik Kenelm Winslow, *Associate Professor of Behavioral Sciences*
B.S. 1963, Pennsylvania State University; M.S. 1965, Ph.D. 1967, Case Western Reserve University
- Maida Rust Withers, *Associate Professor of Physical Education*
B.A. 1958, Brigham Young University; M.S. 1960, University of Utah
- Marvin Milton Wofsey, *Associate Professor of Management*
B.S. 1935, New York University; M.A. 1943, Ph.D. 1967, American University
- William Wolfgang Wolman, *Professorial Lecturer in Statistics*
B.B.A. 1946, City College, New York; M.A. 1949, Columbia University; Ph.D. 1960, University of Rochester
- Reuben Esselstyn Wood, *Professor of Chemistry*
B.S. 1936, Ph.D. 1939, California Institute of Technology; M.S. 1937, University of Chicago
- Philip Allen Woodard, *Lecturer in English*
B.A. 1967, Loyola University of Los Angeles; M.A. 1969, Boston College
- William Thomas Woodward, *Assistant Professor of Painting*
B.A. 1957, M.A. 1961, American University

- Elizabeth Truman Wright, *Associate Professor of English*
B.A. 1939, Allegheny College; M.A. 1955, George Washington University; M.A. 1962, University of Michigan
- Frank Wright, *Studio Lecturer in Art (Drawing and Design)*
B.A. 1958, American University; M.F.A. 1962, University of Illinois
- George Leonard Wright, Jr., *Assistant Professor of Microbiology*
B.A. 1959, Albion College; M.S. 1962, Ph.D. 1966, Michigan State University
- Ruth Wright, *Studio Lecturer in Applied Music (Flute)*
Mus.B. 1952, Eastman School of Music
- Earl Marshall Wysong, Jr., *Assistant Professorial Lecturer in Accounting*
B.A. 1961, Eastern Washington State College; M.B.A. 1964, George Washington University; C.P.A. 1966, State of Maryland
- Helen Bates Yakobson, *Professor of Russian*
B.S. 1935, Harbin Law School, Manchuria
- Harry Elwood Yeide, Jr., *Associate Professor of Religion; Assistant Dean of Columbian College of Arts and Sciences*
B.A. 1953, Williams College; B.D. 1957, Union Theological Seminary; Ph.D. 1966, Harvard University
- Richard Yi-chang Yin, *Associate Professor of Economics*
LL.B. 1946, Fu Jen University, China; M.A. 1950, University of Denver; Ph.D. 1966, Columbia University
- Judith Corbett Young, *Assistant Professor of Physical Education*
B.S. 1965, University of New Hampshire; M.A. 1969, University of Maryland
- Jule Zabawa, *Studio Lecturer in Applied Music (Voice)*
B.A. 1939, Mus.B. 1940, St. Olaf College
- Elmar Heinz Zeitler, *Assistant Clinical Professor of Pathology*
Ph.D. 1953, University of Würzburg, Germany
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B.S. 1939, M.S. 1940, City College, New York
- Hyman Joseph Zimmerman, *Special Lecturer in Physiology*
B.A. 1936, University of Rochester; M.A. 1938, M.D. 1942, Stanford University
- Isaiah Morris Zimmerman, *Associate Clinical Professor of Psychology*
B.A. 1951, M.S.W. 1953, University of California, Berkeley; Ph.D. 1967, Catholic University of America
- Lorenz Eugene Zimmerman, *Clinical Professor of Pathology (Ophthalmic)*
B.A. 1943, M.D. 1945, George Washington University
- John Edmund Ziolkowski, *Assistant Professor of Classics*
B.A. 1958, Duke University; Ph.D. 1963, University of North Carolina at Chapel Hill
- Bernard Charles Zook, *Assistant Professor of Pathology (Comparative)*
B.S. 1962, D.V.M. 1963, Colorado State University
- Artley Joseph Zuchelli, *Professor of Physics*
B.A. 1955, Ph.D. 1958, University of Virginia
- William John Zukel, *Associate Clinical Professor of Epidemiology and Environmental Health*
B.S. 1943, University of Massachusetts, M.D. 1947, Hahnemann Medical College; Dr.P.H. 1961, London School of Hygiene and Tropical Medicine, England

CONSULTANTS IN RESEARCH—GRADUATE SCHOOL OF ARTS AND SCIENCES

- Anton Allen, *Chief, Comparative Pathology Section, Laboratory Aids Branch, Division of Research Services, National Institutes of Health; Comparative Pathology*
D.V.M. 1955, University of Georgia; Ph.D. 1961, University of Wisconsin

- Elizabeth Potts Anderson, *Research Biochemist, Laboratory of Biochemistry, National Cancer Institute; Metabolism of Purines and Pyrimidines*
B.A. 1945, Sarah Lawrence College; M.S. 1947, University of Wisconsin; Ph.D. 1951, Stanford University
- W. French Anderson, *Professorial Lecturer in Biochemistry (Genetics)*
B.A. 1958, M.D. 1963, Harvard University; M.A. 1960, Cambridge University, England
- Franklyn Arnhoff, *Chief, Program Analysis Section, Training and Manpower Resources Branch, National Institute of Mental Health; Experimental Psychology*
B.S. 1948, Long Island University; M.A. 1949, New York University; Ph.D. 1953, Northwestern University
- Julius Axelrod, *Chief, Section on Pharmacology, Laboratory of Clinical Science, National Institute of Mental Health; Physiological Disposition of Drugs*
B.S. 1933, City College, New York; M.A. 1941, New York University; Ph.D. 1955, George Washington University
- Paul William Bowman, *Program Administrator, Biological Sciences Section, Research Grants Branch, National Institute of General Medical Sciences; Cytology*
B.A. 1924, University of Pennsylvania; M.A. 1928, George Washington University; Ph.D. 1930, University of Virginia
- Thomas Elliot Bowman, *Curator, Division of Crustacea, Smithsonian Institution; Zoology*
B.S. 1941, Harvard University; M.A. 1948, University of California, Berkeley; Ph.D. 1954, University of California, Los Angeles
- Roscoe Brady, Jr., *Chief, Section on Lipid Chemistry, Laboratory of Neurochemistry, National Institute of Neurological Diseases and Blindness; Complex Lipids*
B.S. 1943, Pennsylvania State University; M.D. 1947, Harvard University
- Bernard Beryl Brodie, *Chief, Laboratory of Chemical Pharmacology, National Heart and Lung Institute; Physiological Disposition of Drugs*
B.S. 1931, McGill University, Canada; Ph.D. 1935, New York University
- Arthur Brown, *Chief, Virology II Branch, Virus and Rickettsia Division, Biological Sciences Laboratory, Fort Detrick; Virology*
B.A. 1943, Brooklyn College; Ph.D. 1950, University of Chicago
- Dean Burk, *Head, Cytochemistry Section, Laboratory of Biochemistry, National Cancer Institute; Tissue Respiration in Biochemistry*
B.S. 1923, Ph.D. 1927, University of California, Berkeley
- Henry Marcellus Cathey, *Horticulturist, Plant Industry Station, U.S. Department of Agriculture; Plant Physiology: Vascular Plants*
B.S. 1950, North Carolina State University at Raleigh; M.S. 1952, Ph.D. 1955, Cornell University
- Norman Cheville, *Head of Pathologic Investigations and Research Veterinarian, National Animal Disease Laboratory, Agricultural Research Service, U.S. Department of Agriculture, Ames, Iowa; Comparative Pathology*
D.V.M. 1959, Iowa State University of Science and Technology; M.S. 1963, Ph.D. 1964, University of Wisconsin
- Bruce Collette, *Assistant Director, Bureau of Commercial Fisheries Systematics Laboratory, U.S. National Museum, Smithsonian Institution; Biology of Fishes*
B.S. 1956, Ph.D. 1960, Cornell University
- Dean Bruce Cowie, *Physicist and Biophysicist, Department of Terrestrial Magnetism, Carnegie Institution of Washington; Biophysics*
B.S. 1939, Swarthmore College

- Lois-ellin Datta, *National Coordinator of Head Start Evaluation, Office of Economic Opportunity; Developmental Psychology*
B.A. 1952, M.A. 1955, West Virginia University; M.A. 1957, Ph.D. 1961, Bryn Mawr College
- Padma Rag Datta, *Research Biochemist, U.S. Food and Drug Administration; Metabolism*
B.S. 1946, Scottish Church College, Calcutta, India; M.S. 1951, University of Massachusetts; Ph.D. 1956, West Virginia University
- Rosalie Frances De Giovanni-Donnelly, *Assistant Professorial Lecturer in Microbiology*
B.A. 1947, M.A. 1953, Brooklyn College; Ph.D. 1961, Columbia University
- Francois Naftali Frenkiel, *Physicist, Applied Physics Laboratory, Johns Hopkins University; Theoretical Physics: Aerodynamics*
Dip.M.E. 1933, Dip.Ae.E. 1937, University of Ghent, Belgium; Ph.D. 1946, University of Lille, France
- Peter Garlick, *Associate Professor of Economics, Division of Area Studies and Geography, State University of New York, College at New Paltz; International Relations*
B.A. 1949, M.A. 1951, University of Sheffield, England; Ph.D. 1962, University of London, England
- Seymour Geisser, *Professor of Mathematical Statistics and Chairman of the Department of Statistics, State University of New York at Buffalo; Multivariate Analysis*
B.A. 1950, City College, New York; M.A. 1952, Ph.D. 1955, University of North Carolina at Chapel Hill
- Joseph Goldstein, *Assistant Professor of Metallurgy, Department of Metallurgy and Materials Science, Lehigh University; Meteoric Study*
B.S. 1960, M.S. 1962, D.Sc. 1964, Massachusetts Institute of Technology
- Robert Lorimer Grant, *Chief, Insulin Branch, Division of Pharmacology, U.S. Food and Drug Administration; Metabolic Relationships of Insulin*
B.S. 1928, Alma College; M.S. 1929, Ph.D. 1933, University of Michigan
- Robert Edman Greenfield, Jr., *Head, Section on Tumor-Host Relations, National Cancer Institute; Biochemistry of Cancer*
B.S. 1942, Duke University; M.D. 1945, University of Illinois; M.A. 1950, University of California, Berkeley
- Samuel Greenhouse, *Chief, Epidemiology and Biometry Branch, National Institute of Child Health and Human Development; Biometrics; Design of Experiments*
B.S. 1938, City College, New York; M.A. 1954, Ph.D. 1959, George Washington University
- Tibor Jack Greenwalt, *Medical Director, Blood Program, American National Red Cross; Cellular Physiology*
B.A. 1934, M.D. 1937, New York University
- Gordon Guroff, *Head, Section on Intermediary Metabolism, Laboratory of Biomedical Sciences, National Institute of Child Health and Human Development; Amino Acid Metabolism*
B.S. 1954, University of Illinois; M.S. 1956, Auburn University; Ph.D. 1959, University of Wisconsin
- Edward Hacskeylo, *Plant Physiologist, Forest Physiology Laboratory, U.S. Department of Agriculture; Mycology; Plant Physiology: Microorganisms*
B.A. 1949, M.A. 1950, Ph.D. 1954, George Washington University
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APPENDIX: RECENTLY ESTABLISHED REGULATIONS

THE FOLLOWING UNIVERSITY REGULATIONS are under review and may be subject to change in connection with the establishment of judicial processes. Bulletins and handbooks incorporating any changes will be issued as appropriate.

The following resolution, submitted by the University Senate, was approved by the University's Board of Trustees on October 19, 1968:

Whereas, safety and order are essential preconditions of the learning process, and indeed of the very concept of a university; and

Whereas, The George Washington University is committed to protection of free speech and freedom of assembly, and to safeguarding the right of lawful protest on campus; and is committed equally to maintaining the peace and safety of the campus, in the knowledge that all rights are in jeopardy when violence and civil disorder prevail over law and reason;

Now, therefore, be it resolved by the Senate of The George Washington University: that in the event a demonstration at this University exceeds the bounds of free assembly and lawful advocacy, and demonstrators are engaging in unlawful acts which cause or imminently threaten injury to persons or property, or which obstruct or interfere with normal and necessary University activities, this body affirms the authority of the President, or other University officials designated to act in his absence, to take such reasonable steps, if possible after consultation with the Chairman of the Executive Committee of the University Senate and the President of the Student Body, as are required to restore and preserve order; including, if deemed necessary and appropriate, suspension of students or faculty engaging in such acts, and use of such law enforcement personnel as are needed to effect the removal, arrest, and prosecution of law violators. Any such suspension shall be reviewed by an appropriate tribunal as soon after order is restored as is practicably possible.

The following was approved by the University's Board of Trustees on October 19, 1968:

Any student suspended from The George Washington University on the grounds of exceeding the bounds of free assembly and lawful advocacy shall have his suspension reviewed by the Hearing Committee on Student Affairs of The George Washington University as soon after order is restored as is practicably possible.

The following resolution, submitted by the Student Life Committee, was approved by the University's Board of Trustees on October 19, 1968:

Be it resolved that The George Washington University: affirms its traditional commitment to freedom of expression (a) by continuing to permit business and government organizations which are recruiting employees to conduct their activities at designated places on campus, and (b) by placing no obstacle to students who may wish to protest the presence of such recruiters, provided, however, that such protest shall be orderly and shall not impede or disrupt the recruiter in his activities.

The University affirms its place as a forum for the free exchange of ideas (a) by assuring that guests invited to speak on this campus at duly scheduled meetings shall have the right to appear and to be heard, and (b) by sanctioning the freedom of students to express dissent from the views of the speaker, provided, however, that that expression of dissent be orderly and nonobstructive.

The University distinguishes between orderly protest and resistance-by-obstruction; it accepts the former as a legitimate expression of dissent while rejecting the latter as an abridgement of the freedoms of the individuals who may be its object.

The following was approved by the University's Board of Trustees on October 19, 1968:

The George Washington University is opposed to discrimination based on race, color, or creed. Such discrimination may have appeared in campus organizations in the past. In the future, however, no organization can be recognized or supported by the University unless it provides continued assurance of nondiscrimination in membership practices and in intent, considered adequate by relevant committees and officers of the University.

The following was approved by the University's Board of Trustees on October 19, 1968:

The University cannot condone violations of law, including violation of those laws which proscribe possession, use, sale, or distribution of certain drugs. Members of the academic community should know that administrative action, which may include dismissal from the residence halls, revocation of other privileges, or suspension or dismissal from the University, may be taken in order to protect the interests of the University and the rights of others.

The Board of Trustees reaffirms the responsibility of the President and the Faculty to continue to implement this policy.

The following resolution, submitted by the University Senate, was approved by the University's Board of Trustees on January 16, 1969:

Be it resolved by the Senate of The George Washington University: Any member of the University (including as members of the University all persons having a formal connection with the University)

(a) who engages in conduct that unreasonably obstructs teaching, research, and learning, or

(b) who unreasonably obstructs free access to members or guests of the University or to University buildings, or

(c) who disobeys general regulations of the University, or

(d) who damages University property or injures members or guests of the University,

may be punished for his conduct by dismissal from the University, or by some lesser disciplinary action, through procedures established within the University for the government of its members.

In order to insure due process, any student subject to dismissal or other disciplinary action on the grounds of violating any of the premises of this resolution shall have, at his discretion, the right of review of the action by the University Hearing Committee on Student Affairs.

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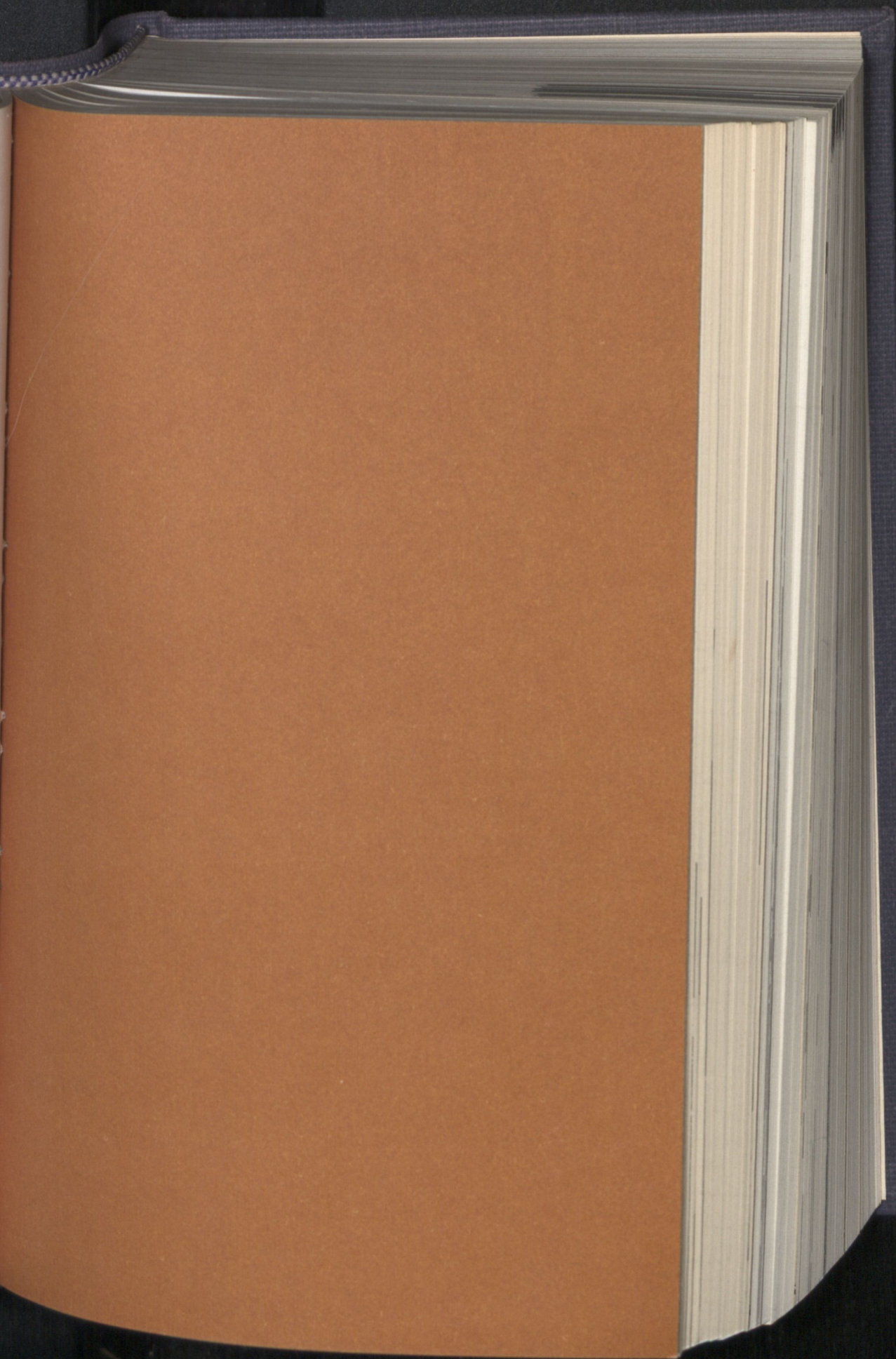
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THE CALENDAR 1971-72*

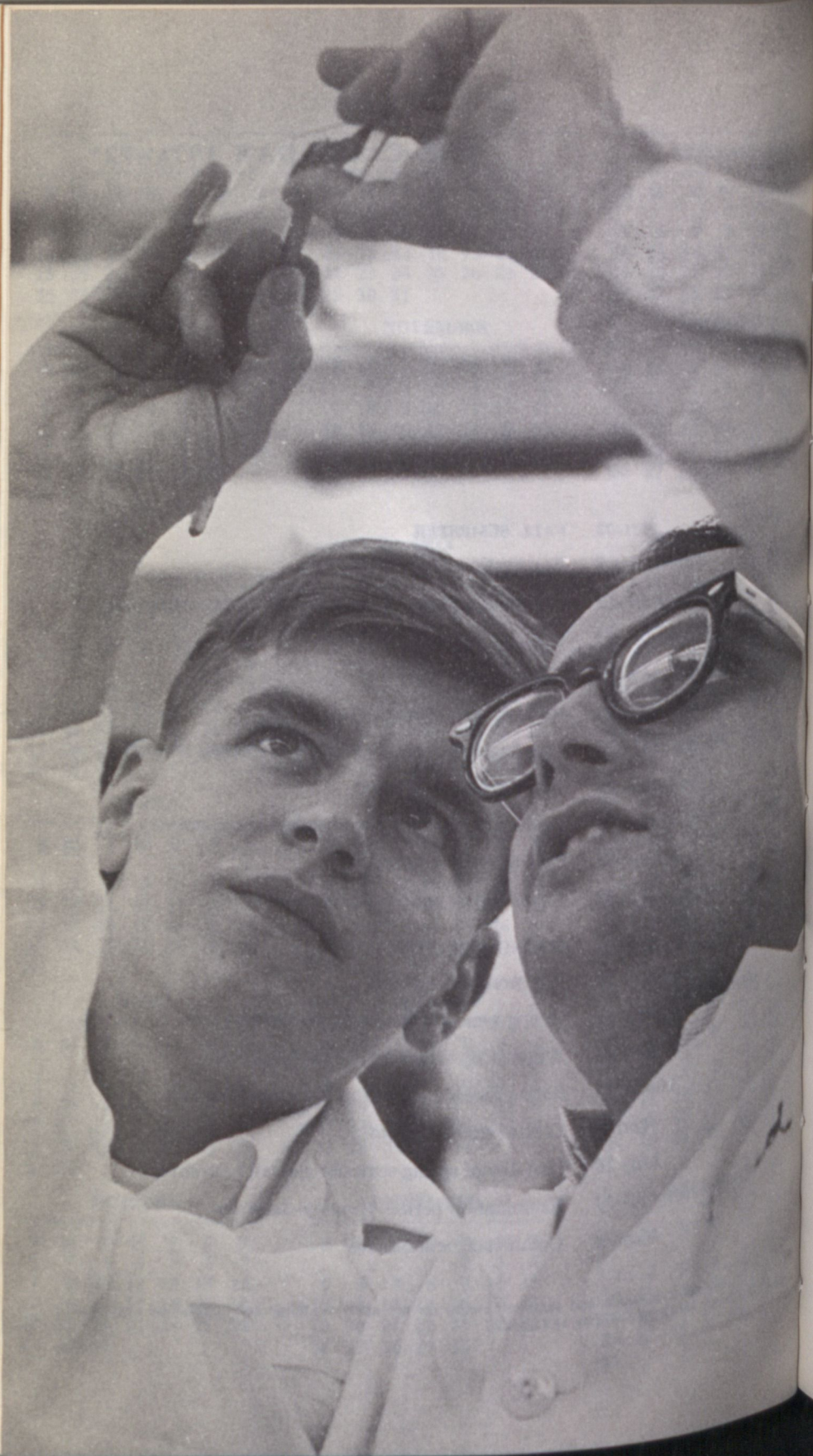
1971-72 FALL SEMESTER

- September 9* Registration *Thursday*
September 10-13 Orientation for first-year students *Friday-Monday*
September 13 Opening Assembly *Monday*
September 14 Classes begin *Tuesday*
October 24 Veterans Day (holiday) *Monday*
November 24 Thanksgiving recess begins after last class *Wednesday*
November 29 Classes resume *Monday*
December 18 Christmas recess begins after last class *Saturday*
January 3 Classes resume *Monday*
January 17-22 Examination period *Monday-Saturday*

1972 SPRING SEMESTER

- January 20* Registration *Thursday*
January 24 Spring-semester classes begin *Monday*
February 21 Winter Convocation (holiday) *Monday*
March 25 Spring recess begins after last class *Saturday*
April 3 Classes resume *Monday*
May 20 Last day of spring-semester classes *Saturday*
May 22-27 Examination period *Monday-Saturday*
May 28 Commencement *Sunday*

*The examination schedule and semester breaks do not apply to third- and fourth-year students.
See *School of Medicine Schedule of Classes*.



THE SCHOOL OF MEDICINE*

Dean of the Medical Center John Parks
Associate Deans of the Medical Center J.J. Feffer,
C.A. Lowe, F.N. Miller, Jr.

THE FACULTY

Professors J.P. Adams, P.C. Adkins, F.D. Allan, L.K. Alpert, Seymour Alpert, M.F. Armaly, J.M. Bailey, R.H. Barter, Leon Bernstein, Brian Blades, Halla Brown, T.M. Brown, C.A. Caceres, Paul Calabrisi, T.C. Chalmers, J.D. Chase, C.S. Coakley, L.R. Culbertson, F.C. Derrick, Jr., Spyros Doxiadis (*Visiting*), W.R. Duryee (*Research*), B.S. Epstein, J.M. Evans, H.L. Feffer, J.J. Feffer, C.M. Goss (*Visiting*), P.P. Griffin, J.A. Halsted, Murdock Head, F.P. Heald, R.S. Higdon, J.C. Houck, Rudolph Hugh, W.N. Jensen, T.N. Johnson, G.A. Kelser, Jr., R.A. Kenney, C.T. Klopp, S.L. Leikin, G.S. Letterman, R.S. Lourie, M.J. Malone, H.G. Mandel, A.M. Margileth, J.W. Millar, F.N. Miller, Jr., J.P. Naughton, William Newman, Leo Oliner, Sean O'Reilly, John Parks, R.C. Parlett, A.E. Parrish, R.H. Parrott, T.M. Peery, T.E. Piemme, J.G. Randolph, J.E. Rankin, Mary Louise Robbins, M.J. Romansky, J.G. Sites, B.W. Smith, J.C. Smith, W.W. Stanbro, Harold Stevens, Irene Tamagna, I.R. Telford, C.S. Tidball, Elizabeth Tidball (*Research*), C.R. Treadwell, G.V. Vahouny, F.W. Wolff, Leon Yochelson

Clinical Professors M.G. Alper, W.S. McCune, H.V. Rizzoli

Associate Professors L.F. Affronti, T.C. Alford, J.C. Aller, Gordon Avery, W.R. Ayers, J.M. Bacos, K.L. Becker, Alexander Breslow, Lawrence Brettschneider, Marie Cassidy, Tsung Cheng, J.B. Christensen, H.W. Clark, Jr. (*Research*), V.H. Cohn, Jr., Milton Corn, J.A. Curtin, Leon Cytryn, Angelo D'Agostino, D.W. Delaney, W.O. Dobbins III, J.A. Dowling, S.E. Fabro (*Research*), W.R. Felts, Jr., J.D. Finkelstein, R.C. Fowler, J.L. Fox, H.M. Grigorian, Margaret Gutelius, C.R. Hartman, Ariel Hollinshead (*Research*), Wellington Hung, Dorothy Huntington (*Research*), F.S. Jannotta, W.R. Jondorf (*Research*), Paula Kaiser, R.P. Kaufman, Peter Kenmore, Marie-Louise Kennedy, K.S. Kim (*Research*), N.C. Kramer, L.S. Lessin, J.R. Lilly, Joseph Lindsay, Jr., R.G. Loudon, W.L. Marsh, D.J. Massaro, Rashid Massumi, A.F. Mastellone, Paul Mazel, J.E. McClenathan, Larry McGowan, G.A. Morales, Mahmoud Mourad, C.F. Murphy, W.J. Nelson, A.F. North, Jr.,

* The Faculty, Executive Faculty, Dean's Council, and committee members are for the academic year 1970-71.
The President of the University, the Vice President for Academic Affairs, the Registrar of the University, and the Director of Admissions of the University are ex officio members of the Faculty and the Executive Faculty.

J.B. O'Connell, J.C. Penhos (*Research*), Arthur Peschin, Lawrence Pierce, H.C. Pierpont, Lois Platt, Melvin Reich, Rebecca Rieger (*Research*), Patricia Russell, L.P. Scott III, C.W. Shilling, P.E. Shorb, Jr., Irene Siu, E.V. Soto, K.M. Stevens, J.A. Straw, N.T. Tsangaris, J.K. Viktora (*Research*), Mary Watt, Benny Waxman, Don Wenger

Associate Clinical Professors J.J. McFarland, Jr., W.P. McKelway

Assistant Professors E.N. Albert, Yousef Al-Doory, R.P. Altman, G.P. August, G.J. Augustin, J.S. Bailey (*Research*), Ann Barnett, W.H. Barton, P.M. Berkman, C.M. Berlin, Jr., Gerrit Besselaar, C.D. Brandt, C.H. Chan, Yang-Ming Chu, Mary Coleman, R.M. Coleman, J.K. Cooper, S.H. Danovitch, Mervyn Elgart, Gloria Eng, S.A. Fagen (*Research*), D.S. Friendly, Whei-Rung Fu, Linda Gallo (*Research*), P.A. Gorman, Richard Granke, Elsa Greenberg (*Research*), L.M. Greenberg, G.A. Hahn (*Research*), Allan Hall, J.S. Haller, Suzanne Hammersberg, Paul Hamosh, Barbara Howard (*Research*), Kun-yen Huang, F.L. Hurley, M.J. Jackson, C.B. Jacobson, B.F. Johnson (*Research*), E.N. Kassira, Robert Keimowitz, S.G. Kent, H.W. Kim, C.H. Klingenmaier, Philip Klubes, Marilyn Koering, E.N. Kraybill, S.J. Kurzbard, J.R. Landoll, John LaRosa, R.A. Lavine, Ann Lodge (*Research*), Massoud Majd-Ardekani, Hildegard Manitsas, Emanuele Mannarino, J.L. Marlow, Nasser Movassaghi, G.H. Nachnani, Karin Nelson, M.N. Ozer, F.A. Peck, L.W. Perry, J.R. Puig, H.B. Richardson, Jr., C.A. Rigg, J.C. Rios, D.I. Robbins, Barbara Roth-Schechter, H.L. Rudman, V.K. Saini, J.R. Shapiro, T.R. Shworles, K.B. Singh, Elizabeth Stephenson, Lovisa Tatnall (*Research*), Glenn Walker, D.W. Watkins, Anna Weihrer, M.W. Werthmann, Jr., D.E. Winer, Karl Wipplinger, Philip Witorsch, G.L. Wright, Jr., B.C. Zook

Assistant Clinical Professor J.L. Levine

Instructors Sidney Abraham, Kathryn Anderson, Minoru Araki (*Research*), L.F. Arias-Bernal, J.I. Auñón (*Research*), Eduardo Azcarate, Catherine Chura, J.B. Craft, Jr., K.J. Dickie, Glenna Fitzgerald, Anne Fletcher, Ma. Eleanor Flores, Mary Flumerfelt, W.P. Fortune, S.I. Granger, Raymond Haddad, Hiltje Irausquin (*Research*), Hemant Joglekar, Vincent Johnson, Jr., Sau-Wah Kwan, S.R. Lane, G.S. Lang, David Lee, F.B. Liebler, J.L. Mabon, Dertad Manguikian, Shirley McMahon, D.R. Meers, S.H. Mendelson, D.B. Murray (*Research*), Karen Olness, Beneta Peacock, R.E. Perkins, Manoochehr Pooya, Olga Pruna, K.R. Rao, Monouchehr Rokni, Mary Salto, R.J. Santos, R.K. Sarin, F.A. Siegel (*Research*), Jane Todaro, W.P. Tunell, S.G. Werner, J.R. Whiteman (*Research*), K.D. Williams, Hoyoko Yahanda

Associate Dean of the Medical Center, for Research C.A. Lowe

Administrator of the University Hospital and Clinic V.F. Ludewig

THE DEAN'S COUNCIL*

L.K. Alpert, Halla Brown, Milton Gusack, F.P. Heald, J.G. Sites, Harold Stevens, C.W. Thompson, C.R. Treadwell, N.T. Tsangaris

* The Dean and Associate Deans of the Medical Center, the Medical Director of the University Hospital, the Medical Director of the University Clinic, the Administrator of the University Hospital and Clinic, and the President of the Medical Alumni Association are ex officio members of the Dean's Council.

EXECUTIVE FACULTY

Professors J.P. Adams, P.C. Adkins, M.F. Armaly, C.A. Caceres, Paul Calabrisi, C.S. Coakley, L.R. Culbertson, F.C. Derrick, B.S. Epstein, J.J. Feffer, P.P. Griffin, Murdock Head, R.S. Higdon, W.N. Jensen, G.A. Kelsner, Jr., R.A. Kenney, C.T. Klopp, H.G. Mandel, A.M. Margileth, J.W. Millar, F.N. Miller, Jr., Sean O'Reilly, John Parks, R.C. Parlett, A.E. Parrish, R.H. Parrott, T.M. Peery, J.E. Rankin, Mary Louise Robbins, J.G. Sites, B.W. Smith, J.C. Smith, W.W. Stanbro, Harold Stevens, I.R. Telford, C.S. Tidball, C.R. Treadwell, Leon Yochelson

Clinical Professors M.G. Alper, W.S. McCune, H.V. Rizzoli

Associate Professors W.E. Anderson, V.H. Cohn, Jr., R.P. Kaufman, W.J. Nelson

Associate Clinical Professors J.J. McFarland, Jr., W.P. McKelway

Assistant Professor Mervyn Elgart

Assistant Clinical Professor J.L. Levine

Associate Dean of the Medical Center, for Research C.A. Lowe

Administrator of the University Hospital and Clinic V.F. Ludewig

COMMITTEES*

COMMITTEE ON ADMISSIONS

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L.F. Affronti, D.H. Glew, Jr., Milton Gusack, Marilyn Koering, Joseph Lindsay, Jr., A.M. Margileth, H.L. Rudman, Irene Siu, W.G. Tompkins, J.H. McClenathan (*Student Representative*), N.O. Polk (*Student Representative*)

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J.G. Sites, *Chairman*

J.B. Christensen, F.P. Heald, Rudolph Hugh, W.N. Jensen, Peter Kenmore, R.A. Kenney, J.E. Rankin, J.J. Rheingold, N.T. Tsangaris, T.R. Crock (*Student Representative*), P.A. DeAlarcon (*Student Representative*), R.W. Weiss (*Student Representative*)

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I.R. Telford, *Chairman*

R.M. Coleman, Milton Corn, J.G. Randolph, B.W. Smith, J.C. Smith, Elizabeth Tidball

COMMITTEE ON RESEARCH

C.R. Treadwell, *Chairman*

K.L. Becker, C.M. Berlin, Jr., V.H. Cohn, Jr., H.M. Grigorian, M.J. Jackson, T.N. Johnson, S.G. Kent, N.C. Kramer, W.S. McCune, Larry McGowan, A.E. Parrish, Melvin Reich, Harold Stevens, F.W. Wolff, C.C. Carson (*Beaumont Society Representative*)

* The Dean and Associate Deans of the Medical Center, the Medical Director of the University Hospital, the Medical Director of the University Clinic, the Administrator of the University Hospital and Clinic, and the President of the Medical Alumni Association are ex officio members of all committees.

COMMITTEE ON LIBRARY

Mary Louise Robbins, *Chairman*

T.C. Alford, F.D. Allan, Alexander Breslow, Halla Brown, G.V. Vahouny,
J.A. Crawford (*Student Representative*)

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W.E. Anderson, J.A. Curtin, B.S. Epstein, H.L. Feffer, M.P. Footer, Paul Joy,
J.L. Marlow, D.J. Massaro, Rashid Massumi, W.S. McCune, R.H. Parrott, T.E.
Piemme, Leon Yochelson, J.A. Crawford (*Student Representative*), A.J. Eberdt
(*House Staff Representative*)

COMMITTEE ON APPOINTMENTS AND PROMOTIONS

G.A. Kelser, Jr., *Chairman*

J.P. Adams, P.C. Adkins, R.C. Parlett, T.M. Peery

ADVISORY COMMITTEE ON ELECTRON MICROSCOPE FACILITIES
AND OPERATIONS

C.S. Tidball, *Chairman*

E.N. Albert, M.F. Armaly, Marie Cassidy, W.O. Dobbins III, Marilyn Koer-
ing, I.R. Telford

ADVISORY COMMITTEE ON PUBLIC AFFAIRS

J.C. Smith, *Chairman*

W.R. Ayers, David Benfer, Catherine Breen, Marion Corddry, R.P. Kaufman,
Jane Lingo, J.F. Mermel, R.S. Woodward (*Student Representative*)

ADVISORY COMMITTEE ON REHABILITATION

J.P. Naughton, *Chairman*

H.L. Feffer, Mahmoud Mourad, Sean O'Reilly, Irene Tamagna

ADVISORY COMMITTEE ON TEACHING AIDS

F.D. Allan, *Chairman*

Gordon Avery, R.A. Kenney, H.C. Pierpont, W.W. Stanbro, J.A. Straw, R.W.
Schulz (*Student Representative*)

DATA PROCESSING STEERING COMMITTEE

V.F. Ludewig, *Chairman*

M.F. Armaly, C.A. Caceres, C.S. Coakley, J.K. Cooper, H.W. Dorsey, R.P.
Kaufman, R.A. Lavine, J.W. Millar, F.J. Naramore, C.S. Tidball

STUDENT ADVISORY COMMITTEE TO THE DEAN

D.H. Burstein, B.D. Burtoff, D.R. Howard, J.H. McClenathan, R.W. Schulz,
L.A. Shapiro, H.M. Uman, R.S. Woodward

General Information

THE SCHOOL OF MEDICINE OF GEORGE WASHINGTON UNIVERSITY has a distinguished history that goes back more than a century. In March, 1825, the School opened with the intention of building "a medical school commensurate with the progress and demands of a rising metropolis, and the improvement of service throughout the country." The School of Medicine, the eleventh oldest in the country, has met this responsibility by providing its students with a foundation in the medical sciences upon which they have built medical careers in practice, teaching, research, or administration.

In 1844, the School took on a new dimension when Congress granted it the use of the Washington Infirmary. Thus one of the earliest general teaching hospitals in the Nation was established in Washington.

At the turn of the century the School was located at its present site—in the center of Washington—close to world-renowned library facilities, comprehensive government medical museums, and numerous federal medical research and scientific establishments.

The distinguished history of the George Washington University School of Medicine closely parallels academic advances and medical progress of the Nation. The School has contributed to both.

The George Washington University Medical Center, established in 1966, consists of the School of Medicine, the University Hospital, the University Clinic, and affiliated hospitals.

OBJECTIVES

The purpose of the School of Medicine is to prepare men and women in the art and science of medicine to meet the health needs of a growing, ever-changing society. It is the responsibility of the School to provide its students with a systematic plan of instruction in the basic medical sciences, with well-guided



clinical experience, with opportunities for expression in research, and with a philosophy in keeping with the highest ethics of the profession.

To carry out its program, the School maintains a well qualified faculty and makes use of facilities which provide exceptional opportunities for research and clinical training in the Washington metropolitan area.

PLAN OF INSTRUCTION

The Faculty and Administration of the School of Medicine have developed and initiated a program of medical education through careful study of past performance, present opportunity, and future need.

Students differ widely in their interests and abilities. Each student is encouraged to maximal achievement within his own limits. This is accomplished by a balanced program of required and elective courses that permit individual scholarly development in specialized medical sciences and research.

The curriculum provides graduated instruction, beginning with the basic medical sciences and expanding to include the more complex aspects of health maintenance and care of the sick. It provides a broad basic preparation for a career in medicine.

In the first year, the schedule begins with an orientation period designed to introduce the new students to the Faculty, the upperclassmen, and the environment for their medical education.

The first semester is devoted to the study of the sciences (anatomy and biochemistry) concerned with the structure and composition of the normal human body. In the second semester of the first year, the science of normal function is further emphasized by courses in physiology. These studies of the normal provide a basis for emphasis on health maintenance, which is a strong positive characteristic of the University's new teaching program. During the second semester the student is also introduced to the concept of disease in a course in microbiology, where the various microbial agents and their effects upon the human body are studied. Elective courses are offered in the second semester of the first year and provide an opportunity for the student to begin the development of special interests under the guidance of skilled advisers.

The basic courses of the first semester of the second year are pathology and pharmacology. In the former the student learns the nature and causes of disease as well as the alterations produced by disease in the tissues and fluids of the human body. He learns to recognize and evaluate the significance of the abnormal. Pharmacology provides an understanding of the mode of action of the various agents employed in the treatment of the sick, and emphasizes the safest and most effective means for their use. Opportunities for elective study are increased during the second year.

The second semester of the second year is planned to acquaint the student with the principles and methods of clinical diagnosis and therapy, and to develop in him an awareness of the physician's responsibility to his patients. The basic concepts of laboratory medicine are taught in special laboratory facilities. During the second semester of the second year, three half-days are available each week for electives.

During the final 20 months of the curriculum, each student has a 13-month clinical clerkship assignment in the University Hospital and Clinic and in affiliated hospitals. Patients with a wide variety of illnesses are assigned to each

student for close personal study under the guidance of a faculty skilled in the various specialties of medical practice. In the course of the clerkship, the student is given increasing responsibility as he demonstrates competence and professional maturity.

During a 24-week elective period, each student has an opportunity to explore general practice, specialty practice, or areas of research which may be of help in deciding the direction of his career. Students with exceptional interests and proven ability may be permitted to spend their elective period in other universities, including those of foreign countries, but most students will find ample opportunities in the University's own published schedule of approximately 150 different electives for upperclassmen.

Courses in the recently established Department of Clinical Engineering are available for elective credit to students interested in this increasingly important field.

CURRICULUM

A. The Basic Medical Sciences

FIRST YEAR	TERM I (16 weeks)	ANATOMY AND BIOCHEMISTRY
	TERM II (16 weeks)	PHYSIOLOGY AND MICROBIOLOGY plus 4 semester-hour credits of electives in Anatomy and Biochemistry
(16-week vacation)		
SECOND YEAR	TERM III (16 weeks)	PATHOLOGY AND PHARMACOLOGY plus 4 semester-hour credits of electives in Physiology and Microbiology
	TERM IV (16 weeks)	

B. Introduction to Clinical Medicine

PHYSICAL DIAGNOSIS, LABORATORY MEDICINE, PSYCHIATRY, INTRODUCTORY CLINICAL LECTURES
plus 4 semester-hour credits of electives in Pathology, Pharmacology, and others

C. Patient Care

INPATIENT CLERKSHIPS:
Psychiatry (4 weeks), Medicine (12 weeks), Surgery (12 weeks), Obstetrics and Gynecology (8 weeks), Pediatrics (8 weeks)
OUTPATIENT CLERKSHIPS:
General Medicine and Medical Specialties (8 weeks),
Emergency Room (4 weeks)

D. Career Electives

SUPPLEMENTARY CLINICAL CLERKSHIPS OR BASIC SCIENCE OR CLINICAL RESEARCH

THIRD AND FOURTH YEARS	TERM V (4 weeks)	
(16-week vacation)		
(the last 88 weeks in rotation, including 4-week vacation)	CLINICAL CLERKSHIPS (56 weeks)	
	ELECTIVES (24 weeks)	

DEGREES

The four-year program of the School of Medicine, described above, leads to the degree of Doctor of Medicine.

In cooperation with Columbian College of Arts and Sciences, a seven-year curriculum leading to the combined degrees of Bachelor of Arts and Doctor of Medicine is offered. In cooperation with the Graduate School of Arts and Sciences programs leading to the combined degrees of Master of Science and Doctor of Medicine or Doctor of Philosophy and Doctor of Medicine are offered.

The departments of the School of Medicine cooperate with the Graduate School of Arts and Sciences in offering the degree of Master of Science in the fields of anatomy, biochemistry, genetics, microbiology, mycology, pathology, pharmacology, and physiology; and in directing the research of candidates for the degree of Doctor of Philosophy in more than fifty fields.

EQUIPMENT AND BASIC SCIENCE FACILITIES

Facilities for the School of Medicine are located at 1331, 1335, 1337, and 1339 H Street, N.W., in downtown Washington.

Administrative Offices.—The administrative offices of the School, 1331 H Street, consist of the offices of the Dean of the Medical Center, Medical Admissions, Research Administration, and the Medical Alumni Association.

Medical School Buildings.—In the buildings housing the School of Medicine, 1335 and 1337 H Street, there are lecture rooms, classrooms, students' rooms, and the following laboratories: anatomy, biochemistry, microbiology, pathology, pharmacology, and physiology. The laboratories are fully equipped to enable students to pursue adequately the laboratory courses and to acquire the technical skill necessary in modern clinical and investigative work.

Research Building.—The Research Building, 1339 H Street, houses special laboratories for graduate and staff research in the departments of Anatomy, Biochemistry, Microbiology, Pharmacology, and Physiology. Special facilities are provided for the study of radioactive compounds, for tissue-culture techniques, and for virologic procedures. Qualified students are invited to participate in certain aspects of the research program either on a volunteer basis or with the support of special Research Scholarships.

Teaching Aids.—This administrative unit of the School of Medicine directs the activities of the following service functions: Medical Illustration and Photography, Audio-visual Facilities (including television), and Xerox Duplication.

Medical Library.—The Medical Library, in well-equipped quarters on the first floor of 1339 H Street, N.W., contains 40,000 carefully selected volumes, including the new medical works and the principal medical journals.

Interlibrary loan service is maintained with other medical and scientific libraries.

The Medical Library is open from 7:30 a.m. to 10 p.m. each class day, Monday through Friday; from 8:30 a.m. to 5 p.m. Saturday; and from 12 noon to 5 p.m. Sunday.

A branch of the Medical Library is maintained in the University Hospital for the use of the resident physicians, interns, and students. It is open every day from 8:30 a.m. to 11 p.m.

CLINICAL FACILITIES

Students at the George Washington University School of Medicine receive clinical experience at the University Hospital, at the University Clinic, and at affiliated hospitals.

The George Washington University Hospital.—This 550-bed hospital, staffed and directed by the Faculty of the School of Medicine, provides excellent clinical opportunities for the instruction of medical students. The Medical Director, Chairmen of Departments, and Directors of Sections are responsible for the supervision of patient care. Under guidance, the individual student has direct responsibility to patients. Clinical conferences are held in which the history of patients, laboratory records, and the physical and pathological findings are presented and correlated.

The Meyer Pavilion, a new addition, has greatly enriched the facilities of the University Hospital by making available new monitored operating rooms; a clinical research unit; a radioisotope laboratory; and radiotherapy facilities, which include a linear accelerator.

The University Clinic.—The University Clinic is housed in a 13-story building adjacent to the University Hospital. Clinic facilities for each Hospital Service and cancer detection are available. Students are assigned for instruction in the University Clinic.

Children's Hospital.—This is one of the largest and best known hospitals for children in the United States. Medical students receive training and clinical experience in pediatrics on both clinic and inpatient services. Special lectures and clinical work in child psychiatry are given in Children's Hospital.

Columbia Hospital for Women.—This 150-bed hospital, situated only two blocks from the University Hospital, is utilized by medical students at George Washington University for clinical training in obstetrics and gynecology. Each year about 10,000 patients are admitted, and there are 12,000 outpatient visits. Almost 5,000 deliveries and 4,500 gynecological operations are performed annually. Columbia Hospital for Women is an affiliated hospital for residency training in Obstetrics and Gynecology in the George Washington University Medical Center Program.

District of Columbia General Hospital.—The District of Columbia General Hospital, one of the largest general hospitals in the country, is a teaching facility for students in the School of Medicine.

The hospital has a bed capacity of approximately 750. It is the principal facility for the care of the indigent sick of the community. Annually, the outpatient department has over 180,000 clinic visits; approximately 83,000 patients register in the emergency room, and 22,000 are admitted to the hospital. This is the largest emergency service in the District, and a great variety of acute medical and surgical problems are examined and treated.

Fairfax Hospital.—This new and already expanding 300-bed voluntary community teaching hospital serves a burgeoning suburban area and provides all clinical services including psychiatry. Each year over 15,500 patients are admitted, 3,500 babies delivered, 8,000 surgical operations performed, and 36,000 persons examined and treated in the Emergency Suite. Fairfax Hospital offers a rotating internship program, a School of Medical Technology, and clinical facilities for a School of Practical Nursing. Students of the School of Medi-

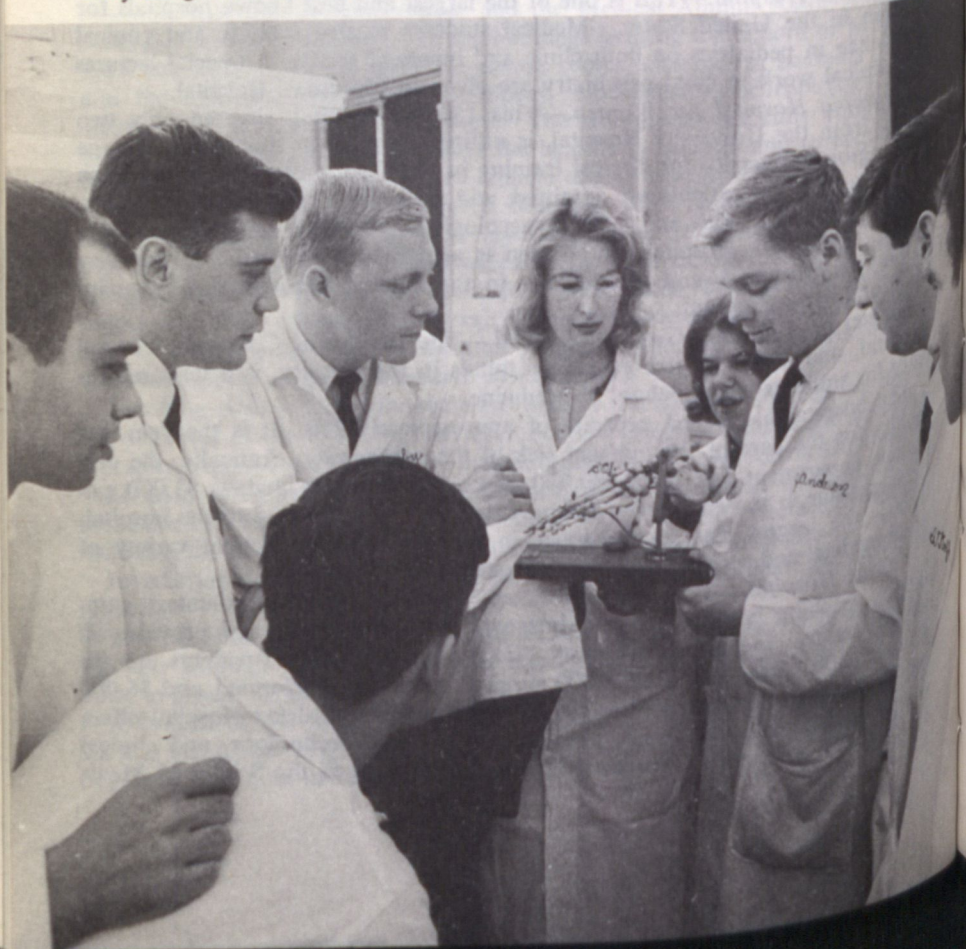
cine serve at this hospital in clinical clerkship and elective programs. Fairfax Hospital is an affiliated hospital for residency training in Obstetrics and Gynecology in the George Washington University Medical Center Program.

St. Elizabeths Hospital.—St. Elizabeths Hospital, established by an act of Congress in 1855, is a federal psychiatric hospital administered under the Department of Health, Education, and Welfare. This hospital provides for the treatment, care, and general well-being of approximately 7,500 patients of whom 5,900 are resident. The facility includes a completely approved General Hospital to meet the needs for medical and surgical care and functions with a full-time staff within the hospital plus attending physicians in various specialties. The hospital maintains an up-to-date medical library.

Medical students of George Washington University utilize the facilities of St. Elizabeths for clinical psychiatric training. Opportunities for research are enhanced by a cooperative arrangement with the National Institute of Mental Health of the United States Public Health Service.

Veterans Administration Hospital.—This new 700-bed hospital, which replaces the Mt. Alto Veterans Administration Hospital and the Veterans Administration Outpatient Clinic, was opened in May, 1965.

In addition to the medical, surgical, psychiatric, neurological, tubercular, and physical medicine and rehabilitation services, there is a large outpatient program; an extensive medical research program; programs in open heart surgery, cobalt therapy, and renal dialysis; a metabolic program; and a specially designed Administrative Research Laboratory.



Washington Hospital Center.—Opened in 1958, this 829-bed private, voluntary institution serves the greater Washington area through a triad of activities: patient care, teaching, and research. The Center is the tenth busiest of more than 7,000 hospitals in the United States and the second busiest private hospital in terms of inpatient admissions. A very active emergency service cares for more than 48,000 patients a year, and the 36 clinics provide all major clinical service except pediatrics for about 82,000 outpatients yearly. In addition to an extensive approved internship and residency program, the Center offers organized instruction for nurses, laboratory and X-ray technicians, medical secretaries, and other health-related vocations.

GOVERNMENT MUSEUMS

The Armed Forces Institute of Pathology, on the grounds of Walter Reed Army Medical Center, affords unexcelled opportunity for study of conditions met in general medicine and surgery as well as those of special military significance. Its collection of anatomical and pathological specimens comprises material received from all areas of the world and is unequalled in this country. The Museum of Hygiene, the National Museum, the Smithsonian Institution, the Botanic Gardens, and the various collections of the Department of Agriculture all afford opportunity for study of materials of special interest in various areas of medicine and its allied sciences.

The Degree of Doctor of Medicine

ENTRANCE REQUIREMENTS

A MINIMUM OF 90 SEMESTER HOURS must have been earned in an accredited institution of higher learning. Credits earned in a professional school can be applied to the fulfillment of this minimum requirement only if they are acceptable by the applicant's college or university toward a Bachelor's degree in Arts or Science. A credit under the quarter system is two-thirds of a semester hour.

It is advantageous to complete four full years of undergraduate work. Only exceptional students are accepted upon completion of the minimal requirements.

The following courses must be completed with satisfactory achievement before the applicant can be certified for matriculation. All required science courses must include sufficient laboratory work to give assurance of familiarity with the experimental methods and techniques of the disciplines.

1. **Biology:** 8 semester hours, including 4 hours of laboratory. This may be either in general biology or zoology but may *not* include separately credited courses in botany.

2. **Chemistry:** 8 semester hours of general inorganic chemistry (which may include qualitative analysis), including 4 semester hours of laboratory; and 6 to 8 semester hours of organic chemistry, including laboratory.

3. **Physics:** 8 semester hours, including at least 2 semester hours of laboratory.

4. **English:** 6 semester hours in composition and literature. This may be the usual introductory college course or its equivalent.

While not required for admission, courses in embryology, histology, genetics, and mathematics are strongly recommended.

ADMISSION PROCEDURE

The applicant should give careful attention to the entrance requirements, supplying all the information asked for on the application and furnishing the School with all the required credentials. An applicant cannot be considered until the following are received:

1. A fully completed *Application for Admission*.
2. Official transcripts of record from the registrar of *each* college, university, professional school, or other medical school attended—including summer sessions. Inclusion of transferred credits on a transcript will *not* serve in place of the transcript from the school where the credits were earned. Applicants currently in attendance should request official transcripts of record to date and send *supplemental transcripts* as soon as courses are completed and grades are recorded.
3. Letters of recommendation from the applicant's premedical advisory committee or from the references given in the application.
4. The results of the Medical College Admission Test, sponsored by the Association of American Medical Colleges. Information concerning this test may be obtained from premedical advisers or the Association of American Medical Colleges, Division of Educational Measurement and Research, One Dupont Circle, N.W., Washington, D.C. 20036.
5. A check or money order made out to George Washington University in the amount of \$25 to cover the cost of evaluating credentials.

ADVANCED STANDING

The School of Medicine's curriculum is such that admission with advanced standing is ordinarily limited to the third year. Applicants for admission to the second year will be considered in exceptional circumstances. The applicant must:

1. Be or have been a regularly registered student in a school of medicine which is a member or an affiliate member of the Association of American Medical Colleges.
2. Be in good standing and eligible to continue in the school where he is currently enrolled, or eligible to re-enter that school if his education has been interrupted.
3. Have completed a course of study at least equivalent to that required for advancement to the year for which he is applying had he been a student in the George Washington University School of Medicine. For admission to the second year, he must have completed all work in anatomy, biochemistry, microbiology, and physiology. For admission to the third year, he must have completed didactic courses in medicine, surgery, obstetrics and gynecology, pediatrics, and psychiatry.
4. Have the endorsement of the dean of his school of medicine or his authorized delegate.
5. Take the Part I Examination of the National Board of Medical Examiners if he is applying for admission to the third year. He should plan to take the examination in June of the year in which he wishes to enter. American citizens attending foreign medical schools are required to pass all subjects of the Part I Examination in order to demonstrate competence in the basic sciences.

The application procedures are otherwise the same as those given under the general instructions for admission.

SELECTION PROCEDURES

The Committee on Admissions reviews credentials as soon as they are complete. The Committee is guided in the selection of students by the applicant's academic ability, the results of the Medical College Admission Test, and personal qualifications as determined by letters of reference and personal interview. Applicants are interviewed regionally or locally on invitation by the Committee. The applicant who is invited to an interview should make every effort to keep the appointment or let the School know promptly if another arrangement must be made. The interviewer's report is an essential part of the applicant's record. The Committee on Admissions will not make a final recommendation until it has been received.

Each applicant is notified of the Committee's decision as soon as possible.

An applicant who is offered a place in a class is required, within two weeks, to notify the Office of Admissions of the School of Medicine of his intent to accept the place reserved for him. A deposit of \$100 must be remitted within two weeks of the date of admission. This deposit will not be refunded after March first. It will be credited toward the tuition for the first semester.

Accompanying the offer of a place in class will be forms for a report on physical condition. This report must be completed and returned to the Office of Admissions of the School of Medicine by the student's physician within two months of receipt of the letter of acceptance.

All questions related to admissions, requests for applications, or the mailing of applications and credentials should be addressed to: Office of Admissions, George Washington University School of Medicine, 1331 H Street, N.W., Washington, D.C. 20005.

REGISTRATION

For the fall semester of the academic year 1971-72, registration will be conducted at the University Gymnasium, 2010 H Street, N.W., from 10 a.m. to 4 p.m., September 9. The time and place of registration for the spring semester, and the summer session of fourth-year clerkships, will be announced.

FEES AND FINANCIAL REGULATIONS

The following fees have been established for the academic year 1971-72. (See page 21 for projected tuition increases for 1972-75.)

Application fee	\$25.00
Tuition fee, for the academic year:	
First-year students	2,500.00
Other students	2,300.00
University Center fee, charged all students (except those granted "leave of absence" status) each semester	37.50
Late registration fee, for failure to register within the designated period	15.00
Late payment fee, charged for failure to make payments when due (see "Payment of Fees," pages 20-21)	15.00
Financial reinstatement fee, for reinstatement after financial encumbrance for nonpayment of fees (see "Payment of Fees," pages 20-21)	35.00

Continuous Registration fee, charged each student granted "leave of absence" status for each semester in the School of Medicine.....	\$74.00
University Center fee, charged each student granted "leave of absence" status, each semester	3.50
Graduation fee	25.00
Returned check fee, charged a student whose check is returned because of insufficient funds or improper drafting.....	15.00

PAYMENT OF FEES

The annual fee of \$2,500 for the 1971-72 academic year for first-year students is payable at the rate of \$1,250 on or before registration day for each semester. The annual fee of \$2,300 for the 1971-72 academic year for all other students is payable at the rate of \$1,150 on or before registration day for each semester. Students registered for the summer session of fourth-year clerkships will be on "continuous registration" without charge until the following fall semester. No student is permitted to complete registration or attend classes until all charges are paid. Tuition and fees are payable at the Office of the Cashier of the University. Checks and postal money orders should be made out to The George Washington University.

The Student Accounts Office has responsibility for billing and maintaining student accounts for tuition, various fees, and room and board charges. While tuition is due and payable in full as described above, a student may sign a deferred payment contract with the Student Accounts Office at the time of registration permitting him to pay one-half of the total tuition and fees (except for fees payable in advance) at the time of registration and the remaining half on or before November 3, 1971 (for the fall semester), and March 15, 1972 (for the spring semester). Interest at the rate of eight per cent per annum on the unpaid balance will be charged from the date of registration to the date payment is made. The University will not obligate itself to notify the student, in advance, of the payment-due date for the second half of the semester charge.

Students receiving tuition assistance in the form of scholarships, government tuition contracts, or other forms of tuition awards are not permitted to sign deferred payment contracts unless the total tuition and fee charges exceed the value of the tuition awards by \$465 or more. Under such circumstances the student may be permitted to pay one-half of the amount due from the student at the time of registration and to defer the balance by signing a deferred payment contract.

Students who fail to make any payment when due will be automatically charged a \$15 late payment fee. Accounts which become 30 days past due will be financially encumbered and will be subject to the interest charge of eight per cent per annum. In the event a student's account is financially encumbered, the student forfeits his rights to the use of the deferred payment contracts in future semesters, and the Student Accounts Office will notify the Registrar to withhold grades, future registration privileges, transcripts, diplomas, and other academic information until the account is settled financially. Financial settlement will require payment in full of all amounts due the University in addition to a financial reinstatement fee of \$35.

After a student has entered the course of instruction he is obligated for the tuition for the full semester. A student registered for the clerkships of the

summer session is obligated for tuition due at the time of registration for the following fall semester, except that in the case of withdrawal or leave of absence a *pro rata* payment will become due immediately.

Acceptance by the University of a student's fees does not in any way obligate the School of Medicine to accept the student for any subsequent semester or summer session, and the right is reserved to require the withdrawal of any student whenever, in the interest of the student or the School, the Faculty deems it advisable to do so.

PROJECTED TUITION INCREASES FOR 1972-75

Academic year tuition increases for first-year students have been estimated as follows: 1972-73, \$500; 1973-74, no increase; 1974-75, not yet determined. Academic year tuition increases for other students have been estimated as follows: 1972-73, \$300; 1973-74, \$400; 1974-75, not yet determined. Every effort will be made to keep tuition increases within these limits. However, it is not possible to project future economic data with certainty, and circumstances may require an adjustment in these estimates.

COST OF TEXTBOOKS AND STUDENT EQUIPMENT

The minimum cost of necessary textbooks and student equipment (microscope, drawing materials, glass slides, clinical thermometer, stethoscope, hemocytometer, uniforms, etc.) is approximately as follows: first year, \$700; second year, \$400; third year, \$200; and fourth year, \$150. Microscopes must be provided by the student. Rentals are not available.

Because many parents may wish some option in meeting and financing all or part of the cost of a college education, the University offers educational loan plans through the Girard Trust Bank, Philadelphia, Pa.; Funds for Education, Inc., Manchester, N.H.; and The Riggs National Bank, Washington, D.C.

Although similar in purpose, these plans vary somewhat in coverage and conditions. One-year and multiple-year plans are available. Insurance covering the life and health of the sponsor is provided through these plans.

Individuals over twenty-one years of age who are employed full-time are also eligible to apply. They may sponsor their own contracts, provided they meet the conditions specified by the plan for which they are applying.

Brochures and applications describing these plans are available in the Office of Student Financial Aid, George Washington University, Washington, D.C. 20006.

DEGREE REQUIREMENTS

DOCTOR OF MEDICINE

Every candidate for graduation with the degree of Doctor of Medicine must have satisfactorily completed the requirements of the School of Medicine as described under "Plan of Instruction" on pages 12-13, including not less than four academic years of study as a matriculated student in Medicine. He must have completed all required courses and passed satisfactorily all prescribed examinations.

HONORS

A candidate who has completed the four-year medical course and has received the grade of *H* (Honors) in courses totalling 50 per cent or more of the total number of semester hours he has taken may be recommended by the Faculty for graduation "With Distinction."

COMBINED BACHELOR OF ARTS AND DOCTOR OF MEDICINE

In order to be recommended for the degree of Bachelor of Arts, the candidate must complete at least 94 semester hours of prescribed college work (at least 30 hours and one year of residence must be completed in Columbian College of Arts and Sciences) and the first year of the medical curriculum. Upon satisfactory completion of the fourth year of the medical curriculum the student becomes eligible for the degree of Doctor of Medicine.

COMBINED MASTER OF SCIENCE AND DOCTOR OF MEDICINE

Students in the School who wish to apply for the combined degrees of Master of Science and Doctor of Medicine must meet the requirements for admission to the Graduate School of Arts and Sciences. They must be recommended by the chairman of the department and by the deans of the Graduate School of Arts and Sciences and the Medical Center.

The Master of Science program consists of a minimum of 30 semester hours of credit. A maximum of 12 semester hours of credit for graduate-level courses *completed as a part of the Doctor of Medicine degree* (and not already applied toward the Bachelor's degree) will be allowed in fulfillment of the requirements of the Master of Science degree. The remaining 18 semester hours of course work, which includes a thesis, must be in course work in the basic medical sciences normally required for a Master of Science degree in the Graduate School of Arts and Sciences.

DUAL PROGRAM FOR THE DOCTOR OF MEDICINE AND DOCTOR OF PHILOSOPHY DEGREES

A dual program is available to qualified students who seek both the Doctor of Medicine and Doctor of Philosophy degrees. The requirements which must be fulfilled for both degrees are identical to those currently and separately established in the School of Medicine and the Graduate School of Arts and Sciences.

A student working toward these degrees may apply a maximum of 24 semester hours of approved work taken in the School of Medicine toward the total of 72 semester hours required to complete the requirements for the Doctor of Philosophy degree. Twenty-four hours of this requirement must be earned in graduate courses during periods when the student is not obligated to full-time enrollment in the School of Medicine, i.e., during summer sessions, vacation periods, etc. The final 24 semester hours of dissertation research toward the Doctor of Philosophy degree may begin concurrently with the final semester of graduate course work. The estimated expected time for completion of this dual program is 6 years.

In order to enter the dual degree program, a prospective student first must apply for and gain admission to both the Graduate School of Arts and Sciences and the School of Medicine separately through established procedures. Upon

admission to both schools, he may then apply for affiliation with the dual degree program. Work toward the Doctor of Philosophy degree is performed under the jurisdiction of a *departmental* Doctoral Committee.

MASTER OF SCIENCE AND DOCTOR OF PHILOSOPHY REQUIREMENTS

The requirements for the degrees of Master of Science and Doctor of Philosophy are stated in the *Undergraduate and Graduate Catalogue* of the University, which is available at the Graduate School of Arts and Sciences, George Washington University, Washington, D.C. 20006.

FINANCIAL AID

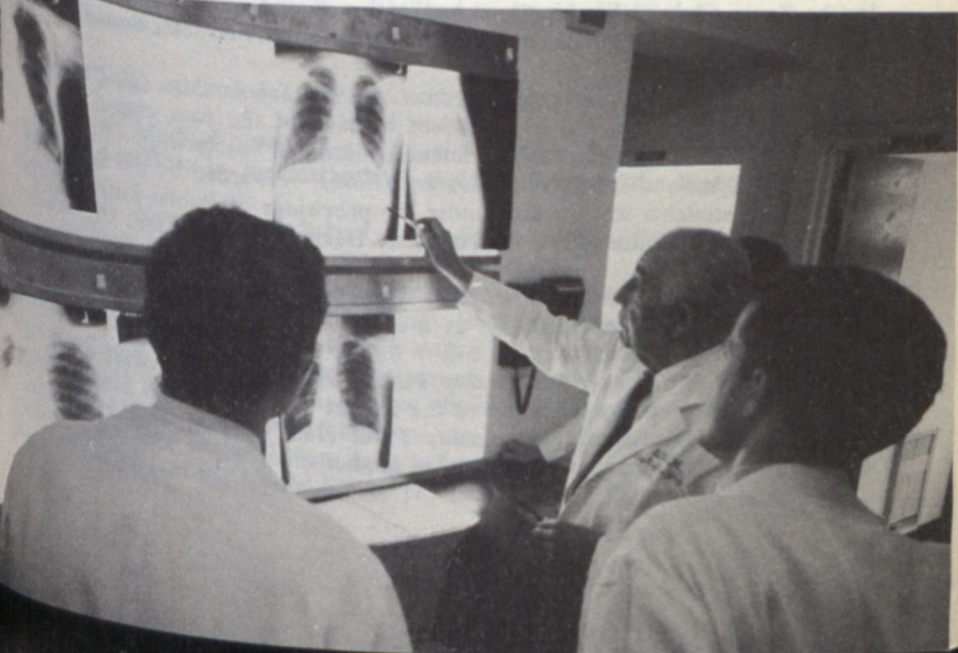
The following fellowships, scholarships, and loan funds are available to students in the School of Medicine. Unless otherwise specified, inquiries should be directed to the Office of the Dean of the Medical Center, George Washington University, 1331 H Street, N.W., Washington, D.C. 20005.

FELLOWSHIPS

Wilbur J. and Edith K. Carr Memorial Fellowship Fund (1965).—By bequest of Edith K. Carr, former Trustee of the University. The income from this fund provides fellowships in surgery, medicine, or medical research at the George Washington University Hospital.

Samuel Jordan Graham Fellowship in Surgery (1961).—By bequest, in memory of Judge and Mrs. Graham. The income from this fund, up to \$2,000, may be used to assist students who are pursuing postgraduate study or research, preferably in surgery, at the School of Medicine.

If no individual is conducting such work or deserving of the award, the income may be used to provide one or more scholarships (to cover tuition and other school expenses deemed appropriate) for students in the School of Medicine. Application should be filed with the Chairman of the Department of Surgery no later than March 1.



Robin Miller Research Fellowship (1953).—A \$3,000 fellowship established by bequest of Mrs. Robin Miller for the study of cardiovascular diseases.

Henry Rau Foundation Student Fellowship Grant (1967).—Awarded annually to a student in the School of Medicine for research in cancer and allied diseases at the George Washington University Clinic.

U.S. Public Health Service Training Grants.—Information concerning training grants in fields of the medical sciences is available at the Office of the Dean of the Medical Center.

SCHOLARSHIPS

Scholarships awarded to students in the School of Medicine are credited for the academic year unless otherwise specified. Each holder must carry a full schedule of academic work during the period for which the scholarship is awarded. Applicants should apply on prescribed forms which must be filed in the Office of the Associate Dean for Student and Curricular Affairs no later than March 15 preceding the academic year for which the scholarship is to be awarded.

Anna Bartsch Hospital Intern Scholarship (1946).—A partial scholarship established by Dr. Anna Bartsch-Dunne as a memorial to her mother. Awarded to a woman intern in the University Hospital.

Anna Bartsch Medical Student Scholarship (1946).—A partial scholarship established by Dr. Anna Bartsch-Dunne as a memorial to her mother. Awarded to a woman in the School of Medicine "of outstanding scholarship, character, and promise, who intends to make the practice of medicine her life profession."

Jack I. Bender Scholarship (1967).—A partial scholarship established by the family of Jack I. Bender as a memorial to their father. Awarded annually to a student in the School of Medicine on the basis of academic performance and need.

Everett Lamont Bradley Scholarship (1954).—A partial scholarship, by bequest of Alice R. H. Bradley in memory of her son, for a student in the School of Medicine.

Dr. Edith Seville Coale Scholarships (1965).—Provided at the request of Dr. Coale for women in the School of Medicine. The scholarships are administered by the Zonta Club of Washington. Application should be made to the Office of the Associate Dean for Student and Curricular Affairs no later than December 1.

George Washington University Medical Alumni Scholarships (1965).—One \$2,000 scholarship awarded to a student in each of the four classes of the School of Medicine, on the basis of financial need and scholarship.

Health Professions Scholarship Program (1966).—Awarded by the School of Medicine to students who qualify under the provisions of Public Law 89-920. Inquiries should be directed to the Associate Dean for Student and Curricular Affairs.

Joan Luria Hines Scholarship (1968)—Established by friends, students, and faculty of the School of Medicine as a memorial to the wife of a medical student.

Robert Woods Johnson Scholarship Fund.—Available to medical students from New Jersey upon application to the Robert Woods Johnson Foundation.

Ki-Wives of Washington Scholarship Fund (1958).—Two tuition scholarships available to students in the School of Medicine.

Medical Research Scholarships and Traineeships.—For student participation in the research programs of the School of Medicine or special training in research methods. Research scholarships are ordinarily awarded for full-time activity during the summer months; research traineeships support part-time work during the academic year. Scholars are "matched" with members of the faculty in accordance with their mutual interests. Trainees are designated by the departments responsible for the programs. These programs have been sponsored by the National Institutes of Health. In addition a number of research scholarships have been made available through the Washington Heart Association.

Chas. Pfizer Medical Scholarship Program (1962).—Established to financially assist a student in the School of Medicine.

School of Medicine Scholarship Fund (1948).—Established by gifts of various donors for tuition awards in the School of Medicine.

David Perry Steinman Memorial Scholarship Fund (1960).—Established by friends and classmates. Awarded annually to a sophomore in the School of Medicine on the basis of need and academic performance.

James J. Whisman Scholarship (1966).—A partial scholarship by bequest of James J. Whisman for needy and deserving students in the School of Medicine.

COLUMBIAN WOMEN SCHOLARSHIP FUNDS

The Columbian Women Scholarships are awarded to women students on the basis of financial need and scholastic attainment. Candidates must have completed a minimum of 15 hours at this University with a minimum *B* (3.0) average. A letter of application for these scholarships should be addressed to the Chairman, Columbian Women Scholarships, care of the Alumni Office, George Washington University, Washington, D.C. 20006, no later than May 15 for the fall semester, and January 1 for the spring semester. Scholarship aid is awarded from income of the following endowments:

Jessie Fant Evans Scholarship Fund (1967).—A \$10,000 fund for tuition aid, established by bequest of Jessie Fant Evans, former Trustee of the University.

Lewes D. and Myrtie H. Wilson Memorial Scholarship Fund (1926).—A fund of \$1,000 for tuition aid, established by Elizabeth Wilson as a memorial to her parents.

LOAN FUNDS

American Medical Association Medical Education Loan Guarantee Program (1960).—Available to medical school students (beyond the first semester of medicine).

Edith K. Carr Medical School Loan Fund (1962).—Established by Mrs. Carr for loans to students in the School of Medicine.

Health Professions Student Loan Program.—This fund is available to a full-time student pursuing a course of study leading to the degree of Doctor of Medicine. Interns, residents, students engaged in premedical or other professional training, students enrolled in programs of study other than those leading to the degree mentioned above, are *not* eligible for these loans.

A candidate must (1) be a citizen of the United States or have such immigration status and personal plans as to indicate that he intends to become a permanent resident of the United States, (2) be in need of the amount of the loan

to be able to pursue his course of study, and (3) be in good standing with the School. Inquiries concerning deadlines and applications should be directed to the Associate Dean for Student and Curricular Affairs.

Joseph H. Himes Loan Fund (1956).—Available for loans to students in the School of Medicine.

W. K. Kellogg Medical School Loan Fund (1942).—Established by W. K. Kellogg Foundation in Battle Creek, Michigan, for loans to students in the School of Medicine.

Jessie B. Martin Loan Fund (1967).—Established by friends of Mrs. Jessie B. Martin, former Editor of Academic Publications at the University. An emergency fund for loans up to \$250, available to students who are degree candidates.

Pfizer Medical School Loan Fund (1953).—Established by Chas. Pfizer & Co., Inc., for loans to students in the School of Medicine.

School of Medicine Loan Fund (1951).—A fund established and supported by medical school students, available for loans to students in the School of Medicine.

Sutherland Medical School Loan Fund (1941).—Established by Rose L. Sutherland for loans to students in the School of Medicine.

W. E. Wrather Medical Student Loan Fund (1967).—Established by gift of Mrs. Olive D. Wrather in memory of her husband, for loans to students in the School of Medicine.

PRIZES

American Medical Women's Association, Inc., Prize.—A certificate awarded annually to each woman ranking academically in the upper 10 per cent of the graduation class. An additional prize of \$100 is awarded to a woman who has the highest scholastic ranking in her graduating class.

Samuel M. and Miriam S. Dodek Prize (1967).—Established in memory of Professor Bernhard Zondek, the eminent discoverer of the endocrinology of the human female reproductive cycle. Awarded annually to a member of the graduating class of the School of Medicine who has attained a commendable knowledge and understanding of the field of female endocrinology.

Allie S. Freed Prize (1957).—Awarded annually to a member of the graduating class in the School of Medicine who has demonstrated exceptional proficiency in the field of preventive medicine.

Walter Freeman Prize (1966).—Awarded annually to a student in the graduating class in the School of Medicine who submits the best essay based on original investigation.

Alec Horwitz Prize (1959).—A prize of \$100 awarded annually to a senior who has demonstrated exceptional proficiency in the field of surgery.

Oscar Benwood Hunter Prize (1952).—Established by The George Washington University Medical Society, now known as The George Washington University Medical Alumni Association. Awarded annually to a member of the graduating class of the School of Medicine who has demonstrated outstanding ability in pathology.

Jacobi Medical Society Prize (1962).—Established in memory of Dr. Abraham Jacobi, the founder of pediatrics practice in the United States. Awarded annually to a member of the graduating class of the School of Medicine who has demonstrated outstanding ability in pediatrics.

Howard Kane-A. F. A. King Obstetrical Society Prize (1937).—Established in memory of Dr. Howard Kane and Dr. A. F. A. King, who served as Professors in the School of Medicine. Awarded annually to a member of the graduating class of the School of Medicine who has demonstrated outstanding ability in obstetrics and gynecology.

Lange Medical Publications Prize.—Awarded annually to two members of the graduating class who are considered outstanding by their classmates. The prize consists of the graduate's choice of four books published by Lange Medical Publications.

Huron W. Lawson Prize (1957).—A prize of \$100 established by Mrs. Lawson in memory of her husband, who was a distinguished member of the Medical Staff of the University, presented annually to a member of the graduating class who has demonstrated exceptional proficiency in the field of obstetrics and gynecology.

Benjamin Manchester Prize (1966).—Established by a grateful patient in honor of Doctor Benjamin Manchester, Clinical Professor of Medicine. Awarded annually to a member of the graduating class in the School of Medicine who has an outstanding record and shows promise of real humanitarianism in the practice of medicine.

C.V. Mosby Book Prize.—Awarded annually to four members of the graduating class who are considered outstanding by their classmates. The prize consists of the graduate's choice of a book published by C.V. Mosby Company.

Julius S. Neviasser Prize in Orthopaedic Surgery (1956).—A prize of \$100 awarded annually to the senior in the School of Medicine who scores the highest grade in a written examination and clinical aspects of orthopaedic surgery.

John Ordronaux Prize (1907).—By bequest, \$150 awarded annually to the member of the graduating class of the School of Medicine who has the highest scholastic standing.

Phi Delta Epsilon Prize (1965).—Awarded annually to a student in the School of Medicine for scholarship, leadership, and service, and who is a member of Phi Delta Epsilon.

Roche Prize.—An Omega watch and a scroll awarded annually to the member of the graduating class who best exemplifies the ideals of the modern American physician. The winner is chosen by vote of the graduating class.

William G. Schafhirt Prize (1966).—By bequest, \$200 awarded annually to the senior student in the School of Medicine for the best original essay or thesis on some medical subject of current public interest.

Upjohn Achievement Prize.—A prize of \$200 and an inscribed plaque awarded annually to a member of the graduating class selected by his or her classmates on the basis of outstanding scholastic and personal achievement.

REGULATIONS

ATTENDANCE

A student is not permitted to attend classes until registration has been completed and fees due have been paid. Regular attendance is required.

GRADES

H—Honors; P—Pass; F—Failure; I—Incomplete; W—Withdraw.

Those students whose performances in a subject, as determined by the department concerned, are of a very high caliber, and who, in addition, have demonstrated those qualities of intellectual curiosity, integrity, and self-discipline which clearly set them apart from the majority of the group, may be assigned the grade of *H* (Honors).

The grade of *P* (Pass) will be assigned to all students who meet the minimum standards of performance in a subject as determined by the department concerned, unless they are entitled to the grade of *H* (Honors).

The grade of *F* (Failure) will be assigned when a student fails to meet the minimum standards of performance in a subject as determined by the department concerned. A student receiving the grade of *F* in any subject may not advance to the work of the following year until he has complied with such recommendations of the Committee on Scholarship as are approved by the Executive Faculty.

The grade of *I* (Incomplete) will be assigned when a student fails to complete all the required work in a course for reasons acceptable to the Associate Dean for Student and Curricular Affairs. A student in the freshman and sophomore years may not proceed into the work of the following year until a grade of *I* has been removed; if not removed, a grade of *I* will be automatically changed to a grade of *F* (Failure) after one year. A student in the junior year and in the clinical clerkships must remove a grade of *I* prior to graduation.

The grade of *W* (Withdraw) will be assigned only when a student is unable to continue in school for reasons acceptable to the Associate Dean for Student and Curricular Affairs (such reasons may *not* include poor scholarship). Such a student may be readmitted, at the discretion of the Associate Dean for Student and Curricular Affairs, within a period of two years, and he may repeat for credit the course or courses in which he had been assigned the grade of *W*.

PROBATION

A student who receives grades of *F* in courses totalling 6 or more semester hours in one semester will be placed on academic probation for the following semester. A student who while on probation who receives a grade of *F* in any course will be continued on probation for the following semester.

ACADEMIC DISMISSAL

A student (1) who exceeds three semesters, consecutive or otherwise, on probation; or (2) who receives grades of *F* in courses totalling 14 or more semester hours in any academic year; or (3) who receives grades of *F* in courses totalling more than 20 semester hours of work in the School of Medicine; or (4) whose academic achievement is otherwise considered unsatisfactory by the Committee on Scholarship will not be allowed to continue in the School of Medicine.

EXAMINATIONS

Examinations, which may be written, oral, or practical, will be held during and/or at the end of each semester.

All students in the School of Medicine are required to take Part I and Part II of the National Board of Medical Examiners. A student failing to attain a passing average for the Part I examination in June must repeat the examination in September of the same year and will be registered on academic probation for the following semester.

ACADEMIC DISHONESTY

Academic dishonesty on the part of any student will result in a disciplinary grade of *F* for the course involved and also may, upon the recommendation of the Dean's Council, result in his suspension from the University for a stated period, at the end of which time he may petition for readmission. The disciplinary grade of "Failure—Academic Dishonesty" will be recorded for the course involved, and this grade will be employed in the computation of the quality-point index. A student so suspended shall be withdrawn from all other courses except those in which all work has been completed.

GRADUATION

Application for Graduation.—Application for graduation must be filed in the Office of the Dean and the fee must be paid at the time of registration for the last semester of the senior year.

Presence at Graduation.—A candidate is required to be present at the graduation exercises unless written application for graduation *in absentia* is approved by the Dean.

RIGHT TO DISMISS STUDENTS

The right is reserved by the University to dismiss or exclude any student from the University, or from any class or classes, whenever, in the interest of the student or the University, the University Administration deems it advisable.

RIGHT TO CHANGE RULES

The University and its various colleges, schools, and divisions reserve the right to modify or change requirements, rules, and fees. Such regulations shall go into force whenever the proper authorities may determine.

RIGHT TO MAKE CHANGES IN PROGRAMS

The right is reserved by the University to make changes in programs without notice whenever circumstances warrant such changes.

RECENTLY ESTABLISHED REGULATIONS

An Appendix (pages 158–59) contains regulations recently approved by the University's Board of Trustees.

UNIVERSITY POLICY ON THE RELEASE OF STUDENT INFORMATION

In general, the policy of the University is one of attempting to keep the student's record confidential and out of the hands of those who would use it for

other than legitimate reasons. At the same time, the policy must be flexible enough not to hinder the student, the University, or the community in their legitimate endeavors.

No information concerning a student will be released except as noted below:

1. Information such as whether or not the student is currently enrolled; dates of attendance; verification of date and place of birth; degrees earned, if any, date, major field or area of concentration, and honors received; home and local addresses and telephone numbers; school, college, or division of enrollment, and class; verification of signature; name and address of parent or guardian.

2. The issuance of formal transcripts of record to recognized institutions of higher learning; the certification of academic achievement to the various recognized professional associations (law, medicine, engineering, education, etc.).

Additional information will be released only on written authorization from the student, or by court order or subpoena. If a subpoena is served, the student whose record is being subpoenaed will be notified and the subpoena will be referred to the University's legal counsel.

Government investigative agencies have no inherent right to access to student files and records. If expressly requested, properly identified representatives from federal, state, or local government agencies may be given the information listed under No. 1 above.

STUDENT HEALTH SERVICES

The Student Health Service is an outpatient clinic designed to assist all registered students with their health needs while attending the University. This service, located at 935 22nd Street, N.W. (in the University Clinic building), assists with health conditions and medical emergencies by advice and treatment, proper referral when necessary, and cooperation with other physicians and medical facilities.

During the academic year, the hours are 9 a.m. to 10 p.m., Monday through Friday, and 9 a.m. to 12 noon on Saturday. The weekday hours during the summer sessions are from 9 a.m. to 9 p.m.; Saturday hours are 9 a.m. to 12 noon. A physician is in attendance during these hours.

For serious illnesses or emergencies that occur when the Student Health Service is closed, students may call the Medical Bureau (223-2200), or go to the Emergency Room of the University Hospital for treatment. Charges for both of these services are solely the responsibility of the student.

Charges for services that are not available through the Student Health Service, such as X-ray and laboratory tests, specialty services, and consultations, etc., must be paid by the student.

The Student Health Service is available only to those students who are currently enrolled in the University. A student who is not currently enrolled, or one who has severed his connection with the University, is ineligible for this service. This service is not available between the last day of examinations for a semester or summer session and the completion of registration for the next semester or summer session.

A student intending to train for an athletic team is required to pass a medical examination. The University is not responsible for injuries received in intercollegiate or intramural games, or in any of the activities of the Department of Physical Education.

HEALTH AND ACCIDENT INSURANCE

In addition to the above service, the Student Health Service has arranged for Health and Accident Insurance, on an elective basis, for full-time students. Arrangements for insurance coverage are the responsibility of the student. The University assists in the subscription process by administering application cards and collecting fees during official registration periods.

A student may subscribe and pay the coverage *only* when he pays his tuition and other fees at registration. For those few students who register late, the subscription will be available during official late registration. *Subscription during late registration will not be available for those students who previously registered and failed to subscribe at that time.*

The fee charged and the coverage provided are effective, with minor variations (see available folder), whether at the University, at home, or elsewhere, on a 6-month basis—September through February for those subscribing for the fall, and March through August for those subscribing for the spring. The fee charged at each official registration period will be the payment required for full coverage for a 6-month period and must be paid in full at the time of subscription.

The policy contract is between the individual student and the insurance carrier and is accepted at any hospital or emergency room that accepts this type of medical coverage. Details of the policy are contained in a folder available at the Student Health Service Office.

PHYSICAL EXAMINATIONS

All first-year students are required to have a comprehensive physical examination prior to admission to the School of Medicine. The students are informed of significant findings and advised regarding such measures as will tend to help them maintain a high standard of health.

In addition medical students benefit from the complete Tuberculosis Case Finding Program which the School maintains. Under this program all students receive tuberculin tests, X-ray examinations, and such special attention from chest specialists as is necessary to reduce to a minimum the dangers from tuberculosis. Students are immunized against those diseases for which proven prophylaxis exists.

RESIDENCE HALLS

Complete information concerning the University's residence halls is available from the Director of Housing, George Washington University, Washington, D.C. 20006.

Information concerning off-campus housing may be obtained at the Office of the Dean of the Medical Center. Reservations for private housing must be made by students.

HONOR SOCIETIES

Alpha Omega Alpha.—National Honor Medical Society. Members of the Junior and Senior classes meeting the qualifications specified by the constitution of the Society are eligible for election to membership.

William Beaumont Medical Society.—Medical students showing unusual ability for medical writing and research are elected by the active members of this society.

Howard Kane-A. F. A. King Obstetrical Society.—The fifteen students in the third- and fourth-year classes who maintain the highest grades in their work in obstetrics are eligible for membership.

Smith-Reed-Russell Society.—Students of the third and fourth years who have received the grade of *H* (Honors) in courses totalling 40 per cent or more of their total semester hours are eligible for membership.

UNIVERSITY CENTER

The term University Center encompasses a building, an organization, and a program. The building is the University's center for community life. It is the physical instrument for implementation of the programs and objectives of the organization.

The organization, composed of students, faculty, administrators, and alumni, in the form of a three-board structure, provides an informal education medium for individual and group activities adapted to the leisure-time interests and needs of the University community. It also provides training for those directly involved in management and programming for the Center.

The primary purpose of the George Washington University Center is the continuing development of a broad cultural, intellectual, social, and recreational program. Its secondary purpose is the provision of its various services and facilities to the campus community for the development of community life.

The Center houses a wide range of facilities to serve the needs of the campus, including dining rooms and a rathskeller, a bookstore, lounges and study areas, a theater, bowling lanes and a billiard room, a University Club, student organization offices and workrooms, meeting and conference rooms, an information center, music listening rooms, social areas, shower and dressing rooms, lockers, and parking accommodations.

RECREATION

The Nation's capital provides abundant recreational resources, a large number of which are available at little or no cost. There are numerous art galleries, museums, concert halls, theaters, swimming pools, parks, and places of great historic interest. Social activities are provided by student organizations of the University, the School of Medicine, and University-sponsored programs such as intramural sports, concerts, recitals, and dramatic productions. Religious faiths are represented in Washington by one or more churches. Washington is one of the most colorful cultural and scientific centers of the world.

The University Hospital and Clinic

THE MEDICAL STAFF CONSISTS of the following groups: Emeritus, Honorary, University, and Courtesy.

Physicians on the Faculty and Staff of Instruction of the School of Medicine are eligible for appointments to the University Hospital Staff. The Administrator of the Hospital and Clinic and the Director of Nursing are ex officio members.

OFFICE OF THE ASSOCIATE DEAN FOR CLINICAL AFFAIRS

J.J. Feffer, B.A., M.D., *Associate Dean*
R.P. Kaufman, B.S., M.D., *Medical Director, University Hospital*
C.T. Klopp, B.A., M.D., *Medical Director, University Clinic*
A.E. Parrish, M.D., *Director of Clinical Research*
Bertel Nelson, B.A., M.D., *Secretary of the Medical Staff, University Hospital*

DEPARTMENTS AND DIVISIONS

Department of Anesthesiology: C.S. Coakley, M.D., *Chairman*; B.S. Epstein, B.A., M.D., *Associate Chairman*
Department of Clinical Engineering: C.A. Caceres, B.S., M.D., *Chairman*
Department of Dermatology: R.S. Higdon, B.S., M.D., *Chairman*
Department of Medicine: W.N. Jensen, B.A., M.D., *Chairman*; G.A. Kelser, Jr., B.S., M.D., *Associate Chairman*
Division of Allergy: Halla Brown, M.D., *Director*
Division of Cardiology: G.A. Kelser, Jr., B.S., M.D., *Director*
Division of Gastroenterology: W.O. Dobbins III, M.D., *Director*
Division of General Medicine: T.E. Piemme, B.S., M.D., *Director*
Division of Hematology: L.S. Lessin, M.D., *Director*
Division of Infectious Diseases: _____
Division of Internal Medicine: Mary Watt, M.D., *Director*
Division of Metabolic and Endocrine Diseases: L.K. Alpert, B.S., M.D., *Director*
Division of Pulmonary Diseases: D.J. Massaro, B.A., M.D., *Director*
Division of Rehabilitation Medicine: J.P. Naughton, B.S., M.D., *Director*
Division of Renal Diseases: A.E. Parrish, M.D., *Director*
Division of Rheumatology: _____
Department of Neurology: Sean O'Reilly, M.B., M.D., *Chairman*
Electroencephalographic Laboratory: Harold Stevens, Ph.D., M.D., *Director*
Department of Neurological Surgery: H.V. Rizzoli, M.D., *Acting Chairman*
Department of Obstetrics and Gynecology: J.G. Sites, M.D., *Chairman*
Department of Ophthalmology: M.F. Armaly, M.S., M.D., *Chairman*
Department of Orthopaedic Surgery: J.P. Adams, B.S., M.D., *Chairman*; H.L. Feffer, B.A., M.D., *Associate Chairman*
Department of Pathology and Clinical Pathology: T.M. Peery, B.A., M.D., D.M.S., *Chairman*
Department of Pediatrics: R.H. Parrott, M.D., *Acting Chairman*; A.M. Margileth, B.A., B.S., M.D., *Associate Chairman*
Department of Psychiatry: Leon Yochelson, B.A., M.D., *Chairman*

Department of Radiology: W.W. Stanbro, M.D., *Chairman*
 Department of Surgery: P.C. Adkins, B.A., M.D., *Chairman*
 Division of General Surgery: P.C. Adkins, B.A., M.D., *Acting Chairman*
 Division of Oral Surgery: S.G. Mead, D.D.S., *Director*
 Division of Otorhinolaryngology: J.J. McFarland, Jr., B.S., M.D., *Chairman*
 Division of Plastic Surgery: G.S. Letterman, B.S., M.D., *Director*
 Division of Traumatology: D.S. Wenger, M.S., M.D., *Director*
 Department of Urology: F.C. Derrick, Jr., B.S., M.D., *Chairman*

ADMINISTRATIVE STAFF

OFFICE OF THE ADMINISTRATOR

V.F. Ludewig, B.S., *Administrator*
 F.A. Menk, *Associate Administrator, University Hospital*
 F.P. Ferraraccio, B.S., M.B.A., *Associate Administrator, University Clinic*
 K.M. Brent, B.S., M.H.A., *Assistant Administrator, University Hospital*
 LeRoy Norem, *Assistant Administrator, University Hospital*
 Donald Wise, B.S., *Assistant Administrator, University Hospital*
 P.D. Torrence, B.A., M.B.A., *Assistant Administrator, University Clinic*
 R.F. Whitehair, *Evening Administrator, University Hospital*
 Irene Menassa, R.N., B.S., M.A., *Assistant Administrator; Director of Nursing*
 Irma Kraft, R.N., M.A., *Associate Director of Nursing*
 Louise O'Neal, R.N., B.A., *Assistant Director of Nursing*
 Rainer Volk, *Comptroller, University Hospital*
 F.D. Cooper, M.S., *Chief Pharmacist*

GENERAL INFORMATION

The George Washington University Hospital functions as an active teaching facility for students of the School of Medicine and for a large House Staff. It is fully approved by the American Medical Association, the American Hospital Association, the American College of Physicians, and the American College of Surgeons, through the Joint Commission for the Accreditation of Hospitals. The University Hospital is located on Pennsylvania Avenue at Washington Circle, six blocks from the White House, near the downtown area of metropolitan Washington. Annual admissions of inpatients number approximately 16,000; visits of ambulatory patients to the University Clinic are approximately 37,000 a year.

The Eugene Meyer Pavilion is a new and attractive six-floor addition to the University Hospital that is fully functional. In addition to one hundred new beds, the Eugene Meyer Pavilion contains an expanded operating suite specially serviced by modern electronic monitoring devices; an In- and Out-surgical Service which has its own reception accommodations, special operating rooms, and recovery area; an entire floor set aside for clinical research activities including a series of superbly equipped special laboratories and eighteen specially designated patient beds; a six-million volt linear accelerator to facilitate radiation therapy; a well-equipped and very active radioisotope laboratory devoted to a wide variety of diagnostic and therapeutic procedures; specially designed teaching and conference areas which have telephonic-dictating, tape-recording, and visual-projection devices available.

Remodeling, updating, and extensive modification of the original Hospital building is now complete. The enlarged and renovated University Hospital is centrally air-conditioned throughout; has a total of 550 beds for inpatient use; and includes a new delivery suite; specially designed and equipped intensive care and coronary care units; enlarged X-ray, pathology, and physical medicine departments; as well as all of the latest diagnostic and supporting facilities. The University Hospital has been designed to make available to patients the highest quality of diagnostic and therapeutic services, as well as to provide a broad spectrum of interrelated teaching and research activities.

The Council on Medical Education of the American Medical Association has approved the University Hospital for straight internship in medicine, pathology, and surgery, and, together with the various specialty boards, for residency training in anesthesiology, cardiac diseases, internal medicine, neurological surgery, obstetrics-gynecology, ophthalmology, orthopaedic surgery, pathology, physical medicine and rehabilitation, plastic surgery, psychiatry, radiology, surgery, thoracic surgery, and urology.

Junior and senior students of the School of Medicine are assigned to the University Hospital and Clinic to serve as clinical clerks in the various specialty departments, in the Emergency Unit, and in different elective programs. Regular conferences for students, house staff, and attending physicians are held.

Other major teaching activities include a residency program in hospital administration; close affiliation with the University's graduate program in hospital administration; programs in medical technology leading to the degree of Bachelor of Science in Medical Technology as well as to a certificate; and an affiliation for the training of practical nurses.

The Hospital has an excellent branch medical library. The House Staff can also arrange to use libraries of the School of Medicine and the University and outstanding city and federal libraries and record collections.

INTERNSHIP, RESIDENCY, AND FELLOWSHIP PROGRAMS

Internships.—Straight internships are available in medicine, pathology, and surgery.

Residencies.—Approved residencies are offered for a total of 138 positions, in the fields of anesthesiology, cardiac diseases, internal medicine and most of its subspecialties, neurological surgery, obstetrics-gynecology, ophthalmology, orthopaedic surgery, pathology, physical medicine and rehabilitation, plastic surgery, psychiatry, roentgenology, surgery, thoracic surgery, and urology. Residency programs are from one to four years in duration, depending upon the service. Residents and fellows in the University Hospital programs also receive appointments as members of the faculty of the School of Medicine with active teaching responsibilities.

Fellowships.—Fellowships, through the School of Medicine, of one or two years are available in allergy, anesthesiology, cardiology, chest diseases, gastroenterology, hematology, infectious diseases, metabolic diseases, oncology, pediatrics, physical medicine and rehabilitation, renal diseases, rheumatic diseases, surgery, thoracic surgery, and University Clinic.

All appointments are for one year with the privilege of applying for continuation on the House Staff. In several of the intern, residency, and fellowship

programs, excellent affiliations are maintained with local and governmental hospitals. Inquiries and applications for internships and residencies should be addressed to the Chairman of the Department or to the Associate Dean for Clinical Affairs of the Medical Center, George Washington University Hospital, 901 23d Street, N.W., Washington, D.C. 20037.

Information relative to fellowships may be obtained from the Chief of the Department concerned or from the Associate Dean of the Medical Center, for Clinical Affairs, in care of the Hospital.

MEDICAL TECHNOLOGY COURSE

This course is open to candidates for the degree of Bachelor of Science in Medical Technology, offered by Columbian College of Arts and Sciences, and to the other applicants meeting the requirements of the Registry of Medical Technologists of the American Society of Clinical Pathologists. These requirements, fully satisfied by the Columbian College program, consist of 3 years (90 semester or 135 quarter hours) of college work in any college or university approved by the recognized regional accrediting agency, including certain specific courses in the science field. The specific science requirements are as follows: *Chemistry*—a minimum of 4 semesters or 6 quarters (16 semester hours or 24 quarter hours) of studies acceptable toward a major in chemistry and including lecture and laboratory; *Biological Sciences*—a minimum of 4 semesters or 6 quarters (16 semester hours or 24 quarter hours) of studies acceptable toward a major in biological science and including lecture and laboratory; *Mathematics*—a minimum of 3 semester hours or 4 quarter hours of college mathematics.

For students enrolled in Columbian College of Arts and Sciences as candidates for the degree of Bachelor of Science in Medical Technology, the Medical Technology Course constitutes the final (fourth) year of qualification for the degree.

In the case of those who have taken their prerequisite work in some other college or university, satisfactory completion of the Medical Technology Course will not satisfy the requirements for the degree from Columbian College.

The Medical Technology Course consists of 12 months of didactic and practical work in clinical laboratory procedures, offered by the Department of Pathology in the University Hospital. Students ordinarily begin this course with the fall semester, but under exceptional circumstances may begin at other times.

A limited number of scholarships are provided by the University Hospital for students enrolled in the fourth year of the degree program. All students in this fourth year must provide themselves with uniforms; laundry of uniforms is provided by the University Hospital.

Upon satisfactory completion of the course a certificate is awarded, and the candidate is eligible for the national certifying examination given by the Registry of Medical Technologists.

Enrollment in the Medical Technology Course is strictly limited so that personal instruction can be given. Acceptance to the Columbian College degree program does not necessarily assure acceptance into the Hospital program. Inquiry about this course should be sent directly to the Department of Pathology, George Washington University Hospital, Washington, D.C. 20037.

Alumni and Allied Associations

THE GENERAL ALUMNI ASSOCIATION

THE OBJECTIVES OF THIS ASSOCIATION are to unite graduates who wish to associate themselves for charitable, educational, literary, and scientific purposes, and to promote the general welfare of the University.

Eligible members are those who have matriculated in any school of the University and left the University in good standing, or any person who is or has been a member of the teaching, research, or administrative staff of the University, or of the Board of Trustees of the University. Active members are those eligible members who are current contributors (dues or otherwise) to or life members of the George Washington University General Alumni Association, the Alumni Association of any school of the University, or contributors to the Annual Support Program.

The Alumni Office is in Bacon Hall, 2000 H Street, N.W., Washington, D.C. 20006. All alumni are urged to keep the Alumni Office informed of changes of address or occupation and to supply information with regard to their fellow alumni.

THE GEORGE WASHINGTON UNIVERSITY MEDICAL ALUMNI ASSOCIATION

The George Washington University Medical Alumni Association, incorporated in 1959, continues the organization previously known as the George Washington University Medical Society.

The stated purposes of the Association are as follows: "This shall be a non-profit organization international in scope, whose objectives shall be to provide constructive services for the alumni of the George Washington University School of Medicine, for furthering the art and science of medicine, research, and for the promotion of the welfare of the George Washington University School of Medicine, its students, the George Washington University Hospital and its trainees."

Active membership in the Association consists of all graduates of the School of Medicine; current members and, on application, past members of the teaching staff of the School of Medicine who hold doctoral degrees; Doctors of Medicine who have had one or more years of postgraduate training in the George Washington University Hospital. Junior membership consists of all members of the student body of the School of Medicine during the time they are students.

The Medical Alumni Association maintains an office in the School of Medicine at 1331 H Street, N.W., Washington, D.C.

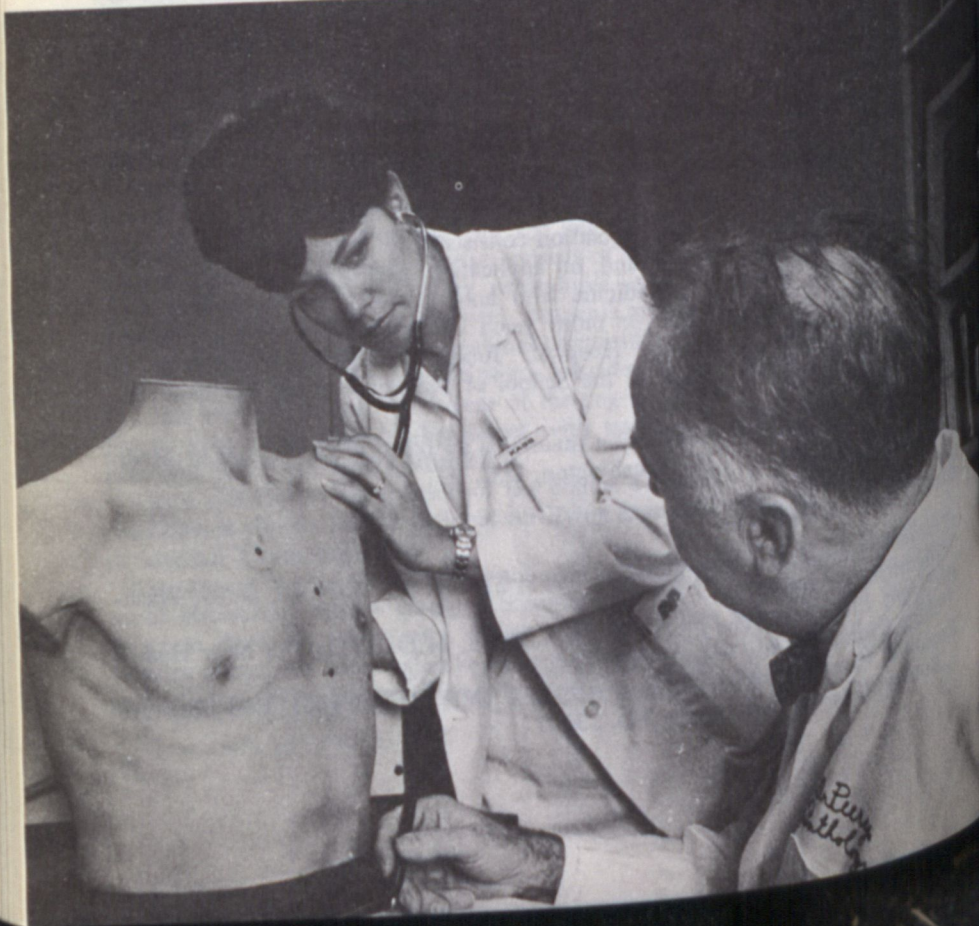
OFFICERS FOR 1970-71

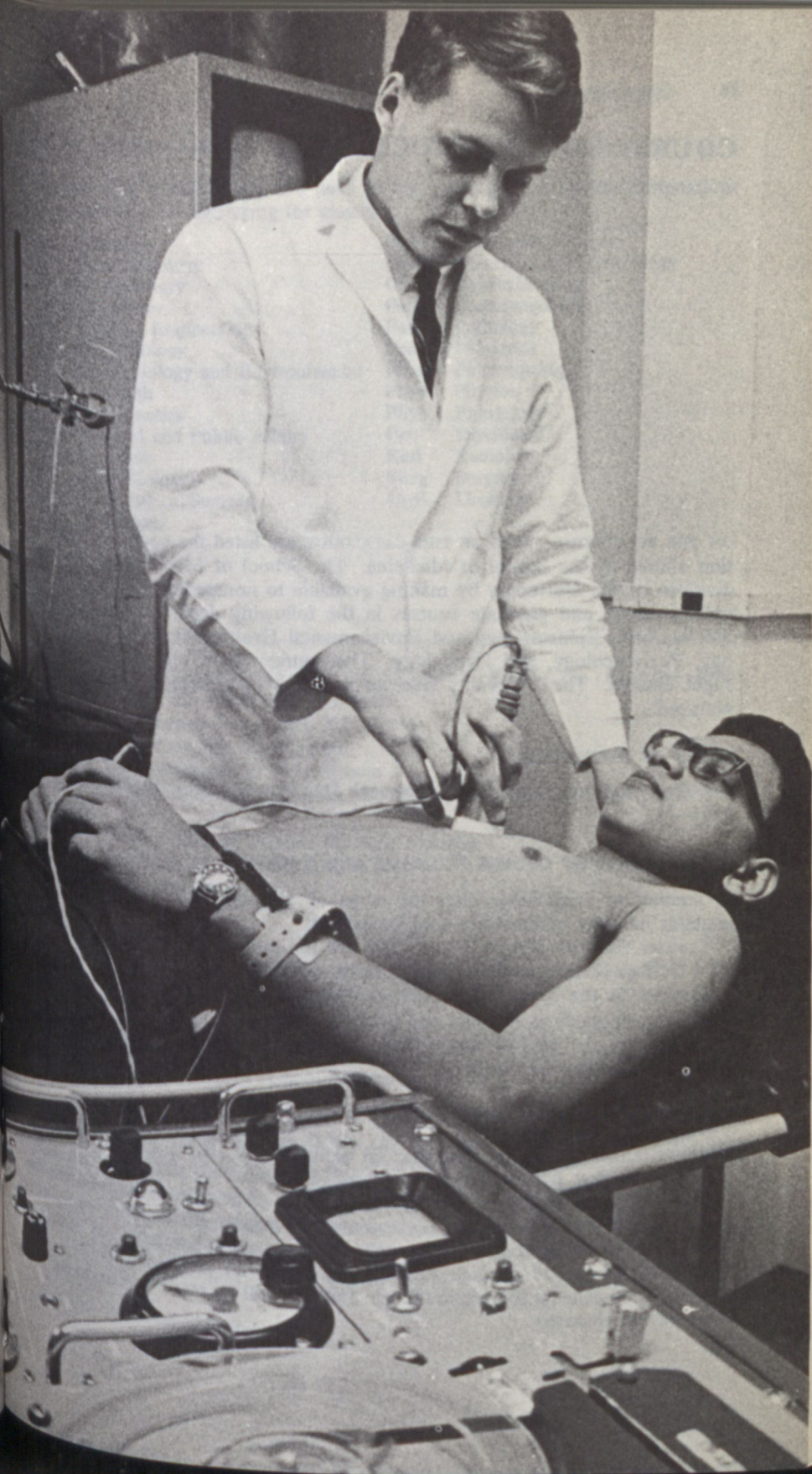
President—Jerome W. Canter, M.D. 1955; 2141 K Street, N.W., #509, Washington, D.C. 20037

President Elect—Marvin P. Footer, B.A. 1938, M.D. 1942; 908 New Hampshire Avenue, N.W., Washington, D.C. 20037

Regional Vice President—Tobias R. Funt, M.D. 1950; 1601 East Broward Boulevard, Fort Lauderdale, Fla. 33301

- Regional Vice President*—Howard G. McQuarrie, M.D. 1955; 508 East South Temple, Salt Lake City, Utah 84102
- Secretary*—John F. Mermel, M.D. 1960; 2141 K Street, N.W., Washington, D.C. 20037
- Treasurer*—Donald H. Glew, M.D. 1948; 4830 V Street, N.W.; Washington, D.C. 20007
- Councilmen:*
- Jerome H. Epstein, B.A. 1948, M.D. 1953; 2141 K Street, N.W., Washington, D.C. 20037
- Maurice T. Gromet, B.A. 1931, M.D. 1934; 130 Lincoln Road, Brooklyn, N.Y. 11225
- Richard I. Kilstein, B.A. 1931, M.D. 1934; 16 East 72nd Street, New York, N.Y. 10028
- Jack B. Kleh, B.A. 1942, M.D. 1944; 915 19th Street, N.W., Washington, D.C. 20006
- Angelo May, M.D. 1937; 450 Sutter Avenue, San Francisco, Calif. 94108
- Carolyn Pincock, B.A. 1931, M.D. 1934; 1944 Seminary Road, Silver Spring, Md. 20910
- Morris Rosenberg, B.A. 1938, M.D. 1941; 2141 K Street, N.W., Washington, D.C. 20037
- Carlos Silva, M.D. 1960; 1631 16th Street, N.W., Washington, D.C. 20006
- George Speck, M.D. 1941; 4801 Kenmore Avenue, Alexandria, Va. 22304
- Allan Zellis, M.D. 1941; 2400 Virginia Avenue, N.W., Washington, D.C. 20037





- 205 Microscopic Anatomy (3)** Telford and Staff
For graduate students. Microscopic structure of cells, tissues, and organs of the human body. Laboratory fee, \$13. (Fall)
- 221-22 Seminar (1-1)** Johnson and Staff
For graduate students. Research reports and discussions of special topics by staff and graduate students. Medical students encouraged to attend. (Academic year)
- 249 Introduction to Anatomical Research (1)** Telford and Staff
For graduate students. Major research techniques as applied to biological materials in the various anatomical disciplines. (Fall)
- 252 Physical Anthropology (1)** Angel
Variations in man and factors affecting him, human evolution and racial differences, anatomy and culture of ancient man. (Spring)
- 254 Fetal Anatomy (2)** Allan
Dissection of early and late human fetus. Comparison of fetal and adult structures. 20 students. Laboratory fee for nonmedical students, \$10. (Spring)
- 256 Human Genetics (1)** C.B. Jacobson
General principles of genetics, new cytogenetics technics, aneuploidy in man and its significance, biochemical aspects of heredity, genetic counseling. (Spring)
- 258 Cytology (3)** Albert and Staff
For graduate students. Detailed study of morphology and function of the cell and its organelles. Basic cytological techniques emphasized. Laboratory fee for nonmedical students, \$20. (Spring)
- 260 Electron Microscopy in Cellular Biology—Lecture (1)** Blanchette-Mackie
Anat 260 may be taken without 261. (Spring)
- 261 Electron Microscopy in Cellular Biology—Laboratory (2)** Blanchette-Mackie
Prerequisite or concurrent registration: Anat 260. 12 students. Laboratory fee for nonmedical students, \$15. (Spring)
- 262 Gross Anatomy of Upper and Lower Extremities (2)** Calabrisi
Detailed dissection, supplemented by X-ray anatomy; discussions, assigned reading. 24 students. Laboratory fee for nonmedical students, \$10. (Spring)
- 264 Gross Anatomy of Head and Neck (2)** Christensen
Detailed dissection, supplemented by X-ray anatomy; discussions, assigned reading. 24 students. Laboratory fee for nonmedical students, \$10. (Spring)
- 266 Gross Anatomy of Thorax and Abdomen (2)** Christensen
Detailed dissection, supplemented by X-ray anatomy; discussions, assigned reading. 24 students. Laboratory fee for nonmedical students, \$10. (Spring)

- 268 **Gross Anatomy of Pelvis, Perineum, and Lower Extremity** (2) Calabrisi
Detailed dissection, supplemented by X-ray anatomy; discussions, assigned reading. 24 students. Laboratory fee for nonmedical students, \$10. (Spring)
- 270 **Dissection of the Human Brain** (1) Johnson
Dissection of major pathways and nuclei of the brain with consideration of ventricular system; conferences and assigned reading. 20 students. Laboratory fee for nonmedical students, \$10. (Spring)
- 272 **Autonomic Nervous System** (1) Allan
Development, microscopic and gross anatomy, function of central and peripheral components of autonomic nervous system. (Spring)
- 274 **Tissues of the Body** (1) Telford
Basic concepts in anatomy, with emphasis on primary tissues of the body—their histogenesis, growth, functions, regenerative capacities, aging, death. (Spring)
- 276 **Advanced Studies in Anatomy** (1) Telford and Staff
For graduate students. Lectures and conferences on selected anatomical subspecialties—endocrinology, teratology, growth, etc. May be repeated for credit. (Spring)
- 278 **History of Anatomy and Surgery** (1) Goss
Lectures and discussions related particularly to the lives and times of outstanding contributors to the advancement of the science of anatomy and surgery. (Spring)
- 279 **Regional Anatomy** (5) Christensen
Advanced dissection of abdomen, thorax, or head and neck. 4 seniors; 4-week elective periods. School of Medicine (December–May)
- 280 **Regional Anatomy** (5) Calabrisi
Advanced dissection of upper and lower extremities, or lower extremities and pelvis. 4 seniors; 4-week elective periods. School of Medicine (January 31–March 26)
- 281 **Neonatal Anatomy** (5) Allan
Detailed dissection of newborn or late fetus. 4 seniors; 4-week elective periods. School of Medicine (January 31–March 26)
- 282 **Advanced Neuroanatomy** (5) Johnson
Detailed dissection of human adult brain. 5 seniors; 4-week elective period. School of Medicine (January 31–February 27)
- 283 **Introduction to Neuroanatomical Research** (5) Johnson
Techniques and principles of research in neuroanatomy. 5 seniors; 4-week elective period. School of Medicine (January 31–February 27)
- 284 **Experimental Teratology** (10) Telford
Congenital abnormalities in animals induced by various experimental methods. 2 seniors; 8-week elective periods. School of Medicine (December–May)

286 Microangiography and Microradiography (5) Christensen
Intimate vasculature of selected organs by injection and radiography.
2 seniors; 4-week elective periods. School of Medicine (December-May)

287 Human Cytogenetics (5) C.B. Jacobson
Chromosomal research on reproductive anomalies, congenital malformations, mutagenic assay. Tissue culture, photomicrography, karyotypic analysis, genetic counseling. 2 seniors; 4-week elective periods. Univ. Hosp. (December-May)

295 Research (arr.) Staff
Content differs each time course is offered; may be repeated once for credit. Fee to be arranged. (Fall and spring)

299-300 Thesis Research (3-3) Staff
(Fall and spring)

398 Advanced Reading and Research (arr.) Staff
Limited to students preparing for the Doctor of Philosophy general examination. May be repeated for credit. (Fall and spring)

399 Dissertation Research (arr.) Staff
Limited to Doctor of Philosophy candidates. May be repeated for credit. (Fall and spring)

Anesthesiology

Professors C.S. Coakley (*Chairman*), Seymour Alpert, B.S. Epstein (*Associate Chairman*)

Clinical Professor D.H. Stubbs

Associate Professors Paula Kaiser, Patricia Russell, Marie-Louise Kennedy, Arthur Peschin, G.A. Morales

Assistant Professors H.L. Rudman, C.H. Klingenmaier, Hildegard Manitsas

Assistant Clinical Professors S.N. Albert, W.E. Bageant, E.J. Dealy, C.E. Fierst, K.J. Hassan, Chalom Albert

Instructors Mary Salto, J.B. Craft, Jr., J.I. Auñón (*Research*)

*301 Anesthesiology (1)

Fundamentals of anesthesia reviewed and correlated with other medical specialties. (Spring) Staff

*302 Clinical Clerkship (5)

Clinical preoperative evaluation, surgical and obstetrical anesthesia, infant and adult resuscitation, inhalation therapy, management of patients in coma, shock, and other problems which may be encountered in medical practice. 1 week—Univ. Hosp., 1 week—Wash. Hosp. Center (2-week periods throughout academic year) Staff

* Required for medical students.

- 380 **Anesthesiology** (5) Coakley
Clinical preoperative evaluation, surgical and obstetrical anesthesia, infant and adult resuscitation, inhalation therapy. 2 seniors; 4-week elective periods. Univ. Hosp. (December-May)
- 381 **Anesthesiology** (5)
Clinical preoperative evaluation, surgical and obstetrical anesthesia, infant and adult resuscitation; inhalation therapy; blood volume determinations. 2 seniors; 4-week elective periods. Wash. Hosp. Center (December-May)
- 383 **Pediatric Anesthesia** (5) Hassan
Clinical preoperative evaluation, pediatric anesthesia, infant resuscitation. 2 seniors; 4-week elective periods. Children's Hosp. (December-May)
- 384 **Special Care Unit** (5) Rudman
Evaluation and management of respiratory failure, rationale and use of automatic ventilators, chronic airway management, cardiovascular support, and intensive care. 1 senior; 4-week elective periods. Univ. Hosp. (December-May)
- 385 **Automated Patient Monitoring** (5) Russell
Automated patient monitoring techniques, introduction to programming of physiologic data for the management of critically ill patients. 2 seniors; 4-week elective periods. Warwick Bldg. (December-May)

Biochemistry

Professors C.R. Treadwell (*Chairman*), B.W. Smith, G.V. Vahouny, J.M. Bailey
 Professorial Lecturers W.W. Burr, Jr. (*Isotopes*), R.W. Albers (*Brain*), Roscoe Brady, Jr. (*Brain*), Arnold Schaefer, Edward Steers, Jr., W.F. Anderson (*Genetics*), H.L. Ozer, Gordon Guroff, Martin Flavin, A.N. Schechter
 Assistant Professors Glenn Walker, Linda Gallo (*Research*), Barbara Howard
 Lecturer P.H. Fishman
 Special Lecturers Walter Mertz (*Inorganic Metabolism*), J.C. Smith, Jr.

- *201 **Medical Biochemistry** (8) Staff
Lectures and laboratory; emphasis on basic principles and their relation to medicine. (Fall)

- 221-22 **General Biochemistry** (4-4) Vahouny
For graduate students. Lectures and laboratory. Prerequisite: Chem 52, 54. Material fee, \$20 a semester. (Academic year)

- 224 **Biochemistry of Enzymes** (1)
Biochemistry of enzymes and enzyme reactions. Prerequisite: Bioc 201 or 221. (Spring)

* Required for medical students.

- 225 Biochemical Procedures (3)** B. Smith and Staff
Laboratory course. Material fee for nonmedical students, \$16. Content differs each time course is offered; may be repeated for credit. (Fall and spring)
- 227 Biochemistry Seminar (1)** Staff
Current literature in biochemistry, mainly for graduate students, but open to limited number of specially qualified medical students. Content differs each time course is offered; may be repeated for credit. (Fall and spring)
- 232 Proteins and Amino Acids (1)** Steers
Prerequisite: Bioc 221. (Spring)
- 241 Isotopes (3)** Burr
Theoretical characterization of isotopes and their applications in biology and medicine. Attention given to counting, health physics and radiation safety, autoradiography, chromatography. Laboratory fee for nonmedical students, \$16. (Spring)
- 251 Carbohydrate Metabolism (1)**
Prerequisite: Bioc 201 or 222. (1971-72 and alternate years: spring)
- 252 Biochemistry of the Brain (1)** Albers, Brady
For medical students; open to limited number of graduate students. Recent biochemical developments in structure, functions, and metabolic processes unique to the brain. (Spring)
- 254 Human Nutrition (1)**
For medical students; open to limited number of graduate students. Application of nutritional principles in humans. (Spring)
- 256 Biochemistry of Organ Function (1)** Kramer
For medical students; open to limited number of graduate students. Emphasis on biochemical processes unique to particular organ systems; application of these processes to evaluation of function. (Spring)
- 258 Inherited Metabolic Diseases (1)** Ozer
For medical students; open to limited number of graduate students. Contribution of molecular biology to understanding of human mutations and hereditary diseases. Specific disease states and genetics of protein structure discussed. Prerequisite: Bioc 222. (Spring)
- 260 Biochemistry of the Steroids (1)** O. Dodek
For medical students; open to limited number of graduate students. Basic chemistry of the steroids, pathways of biosynthesis and metabolism, regulatory mechanisms, physiologic effects, clinical measurement of endogenous steroids, clinical manifestations of steroid imbalance, steroid changes in pregnancy, and steroid therapy. (Spring)
- 262 Biochemistry of the Lipids (1)** Vahouny
For graduate students; open to maximum of 15 medical students. 1971-72 and alternate years: chemistry, properties, occurrence of important classes of biological lipids. 1972-73 and alternate years: metabolism of lipids, including digestion, energy production, biosynthesis, function in specialized

tissues and subcellular structures. Content differs each time course is offered; may be repeated for credit. (Spring)

- 266 **Biochemical Genetics (1)** Anderson
For medical students; open to limited number of graduate students. (Spring)

- 279 **Research in Renal Function, Mutarotase, and Sugar Transport (10)** Bailey
Clinical significance of plasma mutarotase levels in kidney disease. 2 seniors; 8-week elective periods. School of Medicine (December-May)

- 280 **Research in Experimental Atherosclerosis (10)** Bailey
Study of factors influencing the development and course of atherosclerosis in rabbits. 2 seniors; 8-week elective periods. School of Medicine (December-May)

- 281 **Research in Biochemistry of Carbohydrates and Enzymes (10)** B. Smith
Research in a problem already under investigation in the Department or a project in related fields suggested by the student. 2 seniors; 8-week elective periods. School of Medicine (December-May)

- 282 **Research in Biochemistry of Lipid Metabolism and Transport (10)** Vahouny
Biochemical investigation of a clinical problem involving lipids of special interest to the student, or participation in existing research program in the Department. 2 seniors; 8-week elective periods. School of Medicine (December-May)

- 283 **Research in Metabolic Regulation within the Heart (10)** Vahouny
Studies on metabolic regulation and effect of drugs. 2 seniors; 8-week elective periods. School of Medicine (December-May)

- 286 **Research on Transfer RNA and Protein Biosynthesis in Normal and Tumor Cells (10)** R.C. Gallo*
Investigative work on isolation and purification of RNA fractions and function in protein synthesis. 2 seniors; 8-week elective periods. National Cancer Institute (December-May)

- 287 **Research in Biochemistry of B₁₂ Coenzymes (10)** Walker
Research in a problem already under investigation in the Department. 2 seniors; 8-week elective periods. School of Medicine (December-May)

- 295 **Research in Biochemistry (arr.)** Staff
For freshman and sophomore medical students and graduate students. Participation in a project under investigation in the Department or one in a related field suggested by the student and approved by the Staff. Content differs each time course is offered; may be repeated for credit. (Fall and spring)

- 299-300 **Thesis Research (3-3)** Staff
(Fall and spring)

*Dr. Gallo is Senior Investigator at the National Cancer Institute.

398 Advanced Reading and Research (arr.)

Staff

Limited to students preparing for the Doctor of Philosophy general examination. May be repeated for credit. (Fall and spring)

399 Dissertation Research (arr.)

Staff

Limited to Doctor of Philosophy candidates. May be repeated for credit. (Fall and spring)

Clinical Engineering

Professor C.A. Caceres (Chairman)

Associate Professors W.R. Ayers, J.C. Aller

Associate Professorial Lecturer G.B. Devey

Assistant Professors J.R. Landoll, D.E. Winer, Anna Weihrer

Assistant Clinical Professor H.A. Haessler

Instructors David Lee, Sidney Abraham, G.S. Lang, D.B. Murray (Research), K.D. Williams

351 Medical Engineering for Medical Students (10) Fowler, Eisenberg*

Medical and engineering students will be paired whenever possible to provide a mutual introduction to the principles and practices of each discipline. Instruction will be provided through seminar and lecture periods and participation in current laboratory projects. Consultation with instructor required prior to enrollment. 2 seniors; 8-week elective periods. Univ. Clinic (December-May)

353 Electronics and Computers (10) Caceres

Research in one of the following areas—computer analysis of arrhythmias, correlation of ECG with autopsy data, ECG variability, ECG during exercise, instrumentation in blood pressure recording, computer analysis of pulmonary function tests, plethysmograph, phonocardiography, statistical analysis of ECG data, automatic identification of bacteria, computer analysis of electrophoretic curves. 2 seniors; 8-week elective periods. Warwick Bldg. (December-May)

354 Automated Medical Measurement Systems (10) Caceres and Staff

Students work with a multidisciplinary group in the application of automated techniques to real-life problems in clinical medicine. Participation in the design, implementation, and evaluation of multiphasic and ill-patient monitoring system. 2 seniors; 8-week elective periods. Warwick Bldg. (December-May)

Dermatology

Professor R.S. Higdon (Chairman)

Clinical Professor J.Q. Gant, Jr.

Associate Clinical Professor W.M. Narva

* Dr. Eisenberg is Associate Professor of Engineering and Applied Science in the School of Engineering and Applied Science.

Assistant Professor Mervyn Elgart
 Assistant Clinical Professors C.S. Brown, Manuel Landman, P.L. Repetto, Jr.,
 Donald Mitchell, L.J. Eanet, W.R. Vineyard
 Clinical Instructors Phylis Huene, H.S. Golomb, Maria Turner, Ronald Goldner
 Special Lecturer Gerda Landman

380 Dermatology Clinic (5)

Conferences, lectures, and attendance at Dermatology Clinic where patients with wide variety of dermatoses are seen. To acquaint student with diagnosis and treatment of common skin disorders. Dermatologic surgical procedures, technique for using liquid nitrogen, culture and identification of fungi, microscopic diagnosis of common cutaneous diseases. 2 seniors; 4-week elective periods. Walter Reed Gen. Hosp. (December-May)

381 Dermatology Clinic (5)

Goldner

Same as Derm 380. 1 senior; 4-week elective periods. Andrews Air Force Base Hosp. (December-May)

382 Dermatology Clinic (5)

Higdon

Same as Derm 380. 1 senior; 4-week elective periods. Univ. Clinic (December-May)

383 Dermatology Clinic (5)

Narva

Same as Derm 380. 1 senior; 4-week elective periods. Nat'l Naval Medical Center (December-May)

384 Private Office Practice (5)

Brown

1 senior; 4-week elective periods. (December-May)

385 Private Office Practice (5)

Eanet

1 senior; 4-week elective periods. (December-May)

Epidemiology and Environmental Health

Professors J.W. Millar (*Chairman*), J.A. Halsted (*International Health*)
 Associate Professor C.R. Hartman
 Associate Clinical Professors David Frost, W.J. Zukel, L.S. Jaffe
 Assistant Professors E.N. Kassira, Yousef Al-Doory, F.L. Hurley
 Assistant Clinical Professors Lawrence Pyle, Jr., John Vinyard, Jr.
 Assistant Professorial Lecturers S.H. Barboo, Jr., C.H. Miller, N.E. Manos,
 J.A. Lee

***201 Introduction to Epidemiology and Environmental Health (2)**

Millar and Staff

For medical students; open to qualified graduate students. Principles and methodology of epidemiology and biostatistics. Ecological approach to health and disease, including parasitology and mycology. (Spring)

* Required for medical students.

- 217 Advanced Mycology (2)** Al-Doory
Advanced study of fungi. Prerequisite: Micr 201 or equivalent. (Fall)
- 218 Advanced Parasitology (1 or 2)** Millar
For medical students; open to qualified graduate students. Study of host-parasite relationships, including laboratory procedures. 10 sophomores or juniors. (Fall)
- 219 Malariology (1)** Kassira and Staff
The general principles of the diagnosis, life cycle, pathogenicity, treatment, and prevention of malaria. Prerequisite: Epid 201 or equivalent. (Fall)
- 230 Biostatistics (3 or 4)** Hurley, Manos
Introduction to statistical analysis, the theory of measurements and distribution, including significance testing, basic concepts of probability and association, sampling techniques, design of experiments, and introduction to computers. (Fall and spring)
- 295 Research in Epidemiology (arr.)** Staff
Participation in experimental studies in infectious diseases and research in community medicine. Admission by permission of Department. (Fall and spring)
- 299-300 Thesis Research (3-3)** Staff
(Fall and spring)
- *301 Epidemiology and Environmental Health (1)** Staff
Lectures and seminars. Emphasis on means of organizing community to provide epidemiological solutions to health problems, developing an awareness of health resources and significant socioeconomic considerations in bringing total health to the community, showing importance of health as related to individual citizens. World health problems. Prerequisite: Micr 201 or equivalent. (Spring)
- 351 Global Epidemiology (1)** Staff
For medical students; open to graduate students by arrangement. Geographic pathology of disease and international aspects of disease prevention and control, including world demographic problems. (Fall)
- 352 Seminar: Experimental Epidemiology (1)** Staff
For medical students; open to graduate students by arrangement. Student participation in definitions, design, and methods for developing epidemiologic studies of diseases. Coordinated so that protocol developed can be applied to field use. 10 sophomores. (Fall)
- 353 Military Preventive Medicine (1)** Millar
Operational medicine, environmental and sanitation problems, epidemiologic diseases of military importance and their prevention and control. Medical aspects of aerospace and submarine medicine. Sophomores. (Fall)

* Required for medical students.

- 354 **Seminar: Human Ecology (1)** Lee and Staff
Ecology—man within the framework of reference—physical and cultural anthropology, geography, sociology, urban planning, public health, and public administration. (Fall)
- 380 **Methods in Public Health (5 or 10)** Staff
Rotation through all divisions, including mental health, maternal and child health, environmental medicine, communicable diseases; field trips. 15 seniors; 4- or 8-week elective periods. D.C. Dept. of Public Health (December–May)
- 382 **Clinical Practice of Public Health (10)** Staff
Study in depth of public health practice, participating as member of a mobile unit screening for various diseases in the community. 1 senior; 8-week elective periods. D.C. Dept. of Public Health (December–May)
- 384 **Research in Public Health (10)** Staff
Supervised research; the student selects the topic from a broad range of public health problems, including mental health, maternal and child health, environmental medicine, epidemiological methods, biostatistics. 5 seniors; 8-week elective periods. D.C. Dept. of Public Health (December–May)
- 385 **Studies in Cardiovascular Disease (5)** Zukel
Participation in one or more current studies at the National Heart and Lung Institute; selection by the student. 2 seniors; 4-week elective period (February 28–March 26)
- 387 **Diseases of the Tropics (5 or 10)** Staff
Diagnosis, treatment, epidemiology, and laboratory aspects of exotic diseases; experience in the delivery of health care in the tropics. 1 senior; 4- or 8-week elective periods—to be arranged.
- 398 **Advanced Reading and Research (arr.)** Staff
Limited to students preparing for Doctor of Philosophy general examination. May be repeated for credit. (Fall and spring)
- 399 **Dissertation Research (arr.)** Staff
Limited to Doctor of Philosophy candidates. May be repeated for credit. (Fall and spring)

Medical and Public Affairs

Professor Murdock Head (*Chairman*)
Professorial Lecturer J.E. Bryan
Associate Professor C.W. Shilling

- 302 **The Physician, the Patient, and the Public (1)** Staff
A series of forum sessions devoted to the social and political environment of medical practice, the changing nature of the doctor-patient relationship, the search for a new generalist, the future of specialism, the evolution of

new patterns of delivering and financing patient care, the developing roles of government, voluntary insurance and health organizations, group practice units, labor, and industry and consumer agencies. (Spring)

351 Forensic Medicine (2)

Sharpe*, Head

Open to sophomore medical students. Examples drawn from the range of problems arising when the professional interests of lawyers and physicians overlap. Problem contexts include malpractice, personal injury litigation, licensure and discipline, ethics and economics, hospitals and other institutions of practice, and compelled treatment. (Fall)

Medicine

Professors T.M. Brown, M.J. Romansky, L.K. Alpert, J.M. Evans, A.E. Parrish, F.W. Wolff, Halla Brown, Irene Tamagna, J.J. Feffer, W.N. Jensen (*Chairman*), Leo Oliner, T.E. Piemme, T.C. Chalmers, Leon Bernstein, J.P. Naughton, J.D. Chase, G.A. Kelser, Jr. (*Associate Chairman*)

Clinical Professors A.G. Prandoni, J.J. Rheingold, T.S. Sappington, A.B. Rosenbaum, T.J. Greenwalt, Benjamin Manchester, L.E. Putnam, M.H. Stolar, C.W. Thompson, Morton Seidenfeld (*Clinical Psychology*)

Associate Professors W.R. Felts, Jr., Irene Siu, R.C. Fowler, Ariel Hollinshead (*Research—Pharmacology*), Mary Watt, N.C. Kramer, Milton Corn, Rashid Massumi, J.A. Curtin, J.K. Viktora (*Research—Biochemistry*), J.C. Penhos (*Research—Endocrine Research*), H.W. Clark, Jr. (*Research—Biochemistry*), D.J. Massaro, J.B. O'Connell, Lawrence Pierce, W.O. Dobbins III, R.G. Loudon, K.L. Becker, J.M. Bacos, J.D. Finkelstein, R.P. Kaufman, K.M. Stevens, Mahmoud Mourad, Tsung Cheng, L.S. Lessin, Joseph Lindsay, Jr., A.F. Mastellone (*Physical Medicine*)

Associate Clinical Professors Joseph Ney, J.W. Latimer, Jr., T.J. Abernethy, F.S. Bacon, Elizabeth Hill, S.J.N. Sugar, H.D. Ecker, C.W. Jones, E.S. Gladsden, Maurice Mench, F.J. Murray, E.P. Parker III, M.H. Rosenberg, Milton Gusack, Jack Kleh, H.M. Silver, J.P. Mann, Edward Adelson, R.R. Belton, S.D. Loubé, Arthur Ruskin, C.A. Rosenberg, H.E. Ticktin, L.J. Thomas, W.O. Bailey, Jr., Ruth Benedict, Louis Ross, S.W. Kirstein, Israel Kessler, W.D. Brill, Marvin Fuchs, C.A. Schulman, Alfred Baer, Herbert Abramson, Bertel Nelson, J.M. Pisani, S.W. Bush, Joseph King, M.H. Jacobson, J.P. Nasou, Raymond Standard, P.A. Klieger, Henry Simmons

Assistant Professors F.A. Peck, P.A. Gorman, Karl Wipplinger, J.S. Bailey (*Research—Microbiology*), B.F. Johnson (*Research—Clinical Pharmacology*), T.R. Shworles (*Social Psychology*), S.H. Danovitch, Gerrit Besselaar (*Pharmacology*), Philip Witorsch, J.K. Cooper, P.M. Berkman, Paul Hamosh, J.R. Shapiro, Robert Keimowitz, C.H. Chan, G.H. Nachnani, John LaRosa, K.B. Singh, J.C. Rios

Assistant Professorial Lecturer P.O. Woolley, Jr.

Assistant Clinical Professors T.A. Gonder, David Horwitz, R.B. Castell, S.T. Gibson, M.H. Rose, Adolph Friedman, R.B. Miller, F.D. Chapman, R.G.

* Dr. Sharpe is Professor of Law in the University's National Law Center.

Taylor, J.W. Long, J.F. Ambury, T.L. Hartman, Boris Rabkin, L.A. Craig, Jr., A.W. Danish, Alvin Seltzer, C.E. Law, E.L. Rea, Conrad Gossels, H.O. Mott, J.H. Watson, N.H. Rubenstein, W.L. Stone III, B.H. Ostrow, C.D. Cooper, W.R. Ehrmantraut, G.A. Chapman, F.M. Gross, Eleanor Makel, Silas Babin, Jr., Alice Brigham, Jack Crowell, D.S. Davis, J.H. Epstein, F.K. Harris II, R.F. Dyer, E.H. Bauersfeld, William Lewis, E.J. Leonard, H.I. Passes, C.W. Foulke, A.A. Lear, O.W. Donnelly, R.S. Poole, H.C. Sadin, S.J. Talpers, W.L. Hall, George Sharpe, Raymond Scalettar, M.A. Sislen, G.C. Buchanan, G.T. Economos, Irwin Ardham, S.E. Barr, H.A. Moskovitz, J.T. Hagenbucher, G.N. Polis, W.F. Morrissey, R.A. Apter, M.S. Artenstein, J.E. Stauch (*Research*), Jean Lucas, B.R. Cooperman, Francis Chucker, Gilbert Hurwitz, R.S. Wilkinson, W.E. Gallinek, L.H. Biben, W.H. Harvey, William Kurstin, Dorothea Chapman, L.H. Fenton, F.J. Jarsen, C.W. Humphreys, Jr., Paul Schlein, D.J. Hand, Ruben Lopez-Toca, P.A. Haber, William Whitmore, Jr., Francisco Gnecco-Mozo, J.H. Piedra, D.M. Kessner, M.S. Wolfe, C.H. Oliver, Jr., A.B. Cady, W.T. Moore, D.A. Morowitz, Giuseppe Balsamo, G.J. Thorpe, A.B.C. Knudson

Instructors S.H. Mendelson, J.R. Whiteman (*Research*), Raymond Haddad, Hemant Joglekar, R.K. Sarin, Ma. Eleanor Flores, Vincent Johnson, Jr., F.A. Siegel (*Research*), Hoyoko Yahanda, Manoochehr Pooya, Olga Pruna, Catherine Chura (*Clinical Pharmacology*), K.J. Dickie, R.J. Santos

Clinical Instructors N.K. Bohrer, N.G. Goodman, J.D. Herman, Scheldon Kress, Frederick Meyers, Lily Ruckstuhl, C.U. Shilling, H.O. Schindelar, R.M. Kaufman, Andre Barrabini, Robert Kramer, F.J. Borsody, Richard Schoenfeld, M.J. Halberstam, D.W. Datlow, G.G. Kay, R.A. Fischer, R.M. Huffman, E.B. Thompson, Florentino Palmon, S.J. Conway, L.P. Appel, M.A. Herman, R.O. Knox, R.S. Waldman, R.W. Turner, C.W. Kinzer, S.A. Schwartz, Andree Thomas, Marvin Schneider, Fidel Quintana, Gladys Rosenstein, Herman Rosenstein, A.G. Brody, Harris Kenner, N.P. Trujillo, I.V. Magal, G.A. Tralka, L.F. Barker, R.J. Lindeman, D.D. Haut, Isaac Weiszer, P.R. Lenz, A.J. Anderson, P.G. Rochmis, J.F. Mermel, Richard Hochman, P.J. Sullivan, S.H. Schachner, M.M. Shefferman, PooLiang Chang, E.J. Chap, L.M. Weiss, N.T. Connally, Bernard Grand, J.C. Perkins, A.M. Mondzac, H.J. Alpert, P.V. Holland, Leo Janis, R.A. McConnaughy, S.R. Rishi, A.M. Gotto, Jr., Israel Spector, B.G. Vlalukin, C.T. Caskey, R.G. Masson, Devanhalli Ramaswamy, F.H. Burbank, Dorothy Millon, K.S. Gimbel, J.H. Holbrook, D.L. Pearle, Charles Lightdale

Special Lecturers Sol Katz (*Pulmonary Disease*), R.W. Berliner (*Renal Disease*), W.L. Nalls (*Pulmonary Disease*), Albert Sjoerdsma (*Internal Medicine*), D.S. Frederickson (*Internal Medicine*), T.W. Mattingly (*Cardiology*)

*301 Introduction to Medicine (8)

Staff

(Formerly Med 301 Physical Diagnosis (4), Med 302 Laboratory Medicine (2), and Med 303 Principles of Internal Medicine (2))

Principles and practice of internal medicine. Clinical application of laboratory examinations of blood, body fluids, exudates, etc. Theoretical and practical application of principles of physical diagnosis; training with bed patients under individual instruction. Designed to develop ability in examination of patients and case history taking. Univ., D.C. Gen., and affiliated hosps. (Spring)

* Required for medical students.

***305 Inpatient Clerkship I (10)**

Staff

Training in comprehensive study of patients; history and physical examination; ward rounds, consultations, conferences, preceptorial teaching, seminars. Univ Hosp. and Wash. Hosp. Center. (8-week periods throughout academic year)

***306 Inpatient Clerkship II (5)**

Staff

Continuation of Medicine 305. V.A. and D.C. Gen. hosps. (Spring—4 weeks)

***308 University Clinic (10)**

Watt and Staff

Studies of ambulatory patients under close supervision. Daily clinics in general medicine and various specialties; conferences on current cases. Univ. Clinic (8-week periods throughout academic year)

311 Rehabilitation of Teenage Drug Offenders (1)

LaRosa

Students participate one evening a week in the youth rehabilitation program of the Narcotics Treatment Agency of the District of Columbia. Limited to 18 2nd-year medical students. (Fall—3 hours a week)

317 Exercise ECG: Diagnosis of Heart Disease and Evaluation of Physical Fitness (5)

Gorman

Application of graded treadmill exercise ECG to diagnostic problems in ischemic heart disease and to evaluation of physical fitness. 1 senior; 4-week elective periods. Univ. Clinic (December–May)

318 Intensive and Coronary Care (5 or 10)

Reefe†

Principles and techniques of and practice in emergency care in an active intensive-care unit. Participation as a member of a team in a clinical program involving complete study and therapy of acute emergency problems and acute coronary disease. Teaching rounds, seminars. 2 seniors; 4- or 8-week elective periods. V.A. Hosp. (December–May)

319 Renal and Electrolyte Disorders (5)

Berkman

Participation in consultations on renal and electrolyte abnormalities; follow-up of patients previously seen. Experience in the examination of the urinary sediment, peritoneal, and perhaps hemodialysis. Participation three mornings a week in the Journal Club, in association with the Endocrine Unit. Collateral reading, conferences, and ward rounds. By arrangement, a student may participate in a research project during an extended elective period. 1 senior; 4-week elective periods (extended by arrangement). Wash. Hosp. Center (December–May)

320 Research: Allergy or Related Field (30)

H. Brown

Research project in clinical or experimental allergy or a related field. 1 or 2 seniors; minimum of 6 months. (December–May)

321 Clinical Gastroenterology (5)

Danovitch

Experience in clinical gastroenterology: consultations and follow-up of patients. Presentation of patients at conferences; observations and diagnostic procedures, including endoscopy; review of histology of lesions of intestinal tract and liver. 1 senior; 4-week elective periods. Wash. Hosp. Center (December–May)

* Required for medical students.

† Dr. Reefe is Acting Chief of Medical Service at the Veterans Administration Hospital.

322 **Clinical Gastroenterology (10)**

Dobbins

Intensive clinical experience with patients who have digestive diseases, including those of the gastrointestinal tract, liver, and pancreas. Consultations, teaching rounds, and research seminars. 4 seniors; 8-week elective periods (extended by arrangement). V.A. Hosp. and Univ. Clinic (December-May)

323 **Morphology of the Intestines (10)**

Dobbins

Research designed to acquaint the student with a variety of morphologic techniques used in the study of mucosal disease of the gastrointestinal tract. Includes electronic microscopy and light microscopy techniques—phase and fluorescent microscopy. Open to a senior who preferably will be able to continue on a part-time basis after completion of elective period. 1 senior; 8-week elective periods (extended by arrangement). Univ. Clinic (December-May)

324 **Research in Mechanisms of Sodium Homeostasis (15)**

Keimowitz

Supervised laboratory research on the mechanisms of sodium homeostasis—in *vitro* and *in vivo* animal studies using various techniques, including isotopic tracer experiments. Reading assignments of relevant physiological and clinical literature. 1 senior; 12-week elective periods. Univ. Hosp. (December-May)

325 **Biochemical Abnormalities in Disorders of Lipoprotein Metabolism (10)**

LaRosa

Experience in the use of modern techniques of protein separation, including ultracentrifugation, electrophoresis, and chromatography; experience in handling radioactive isotopes. Clinical experience with patients with hyperlipoproteinemia. 1 senior; 8-week elective periods. Univ. Hosp. and National Heart and Lung Inst. (December-May)

326 **Ambulatory Health Care (10)**

Piemme

Participation in a combined community health program in the Division of General Medicine. Specific elements involving the capacity to deliver health care within a community. Conferences, reading assignments in the concepts of community health and health care delivery. Exchange with similar programs in other universities is possible if students wish to elect more than the 8-week minimum. 2 seniors; 8-week elective periods. (December-May)

327 **Clinical Hematology (5)**

Pierce

Clinical evaluation of inpatients and outpatients with symptoms referable to the myelopoietic system using bedside and laboratory investigative parameters. 1 senior; 4-week elective periods. Wash. Hosp. Center (December-May)

328 **Endocrinology (5)**

Shapiro

The student will evaluate patients referred to the Endocrinology Service, take part in planning diagnostic work-ups or therapy programs, and be responsible for case presentations. Exposure to techniques used in the Endocrinology Laboratory such as protein binding determinations and radio-immuno assay of hormones. Participation in Journal Club. 1 senior; 4-week elective periods. Wash. Hosp. Center (January 31-May 21)

329 Pulmonary Diseases (5)

Performance and interpretation of pulmonary function studies, including ventilatory studies, diffusing capacity, and blood gas analysis; daily teaching rounds and supervised consultations on patients with various pulmonary and infectious diseases. Participation in the Pulmonary Clinic; techniques and principles of inhalation therapy. 1 senior; 4-week elective periods. Wash. Hosp. Center (December 6–April 23) Witorsch

360 Hematology Preceptorship (5)

Observation of and participation in diagnosis and treatment of patients with hematologic disorders. 1 senior; 4-week elective periods. Univ. Hosp. and Physician's Office (December–May) Rheingold

362 Cardiology (5)

Opportunity to observe and take part in cardiac evaluation and patient care under tutorial supervision. Participation in electrocardiograph interpretation and other diagnostic procedures as well as activities in the Intensive Care Units, Pediatric Wards, and Cardio-Thoracic Surgical program. 3 seniors; 4-week elective periods. Walter Reed Gen. Hosp. (December–May) Czarnecki*

363 Pulmonary and Communicable Diseases (5)

Clinical experience with a wide variety of chronic pulmonary and infectious disease problems. Thoracenteses and pleural biopsies, spinal taps, and pulmonary function testing. Weekly basic pulmonary physiology lectures and attendance at Medical-Surgical Chest conferences. 2 seniors; 4-week elective periods. Walter Reed Gen. Hosp. (December–May) Zurek†

364 Renal-Dialysis Service (5)

Exposure to a wide variety of renal diseases, hemo- and peritoneal dialysis, renal transplantation. Observation in renal physiology laboratory. 2 seniors; 4-week elective periods. Walter Reed Gen. Hosp. (December–May) Knepshild‡

366 Clinical Endocrinology (5)

Clinical experience in endocrinology, metabolism, and genetics. Student will be given opportunity to examine endocrine patients, make preliminary diagnosis, and assist in treatment. 3 seniors; 4-week elective periods (extended by arrangement). V.A. Hosp. (December–May) Becker

368 Effect of Drugs in Man (5)

Correlation between clinical research at the bedside and laboratory experimentation. Participation in clinical and laboratory follow-up of patients. Introduction to long-term controlled studies on the effects of drugs in hypertension with exposure to data retrieval, programming, and computer analysis. 2 seniors; 4-week elective periods. Wash. Hosp. Center (December–May) Viktora, Mauger§, Wolff

369 Metabolic Fate of Drugs in Animals and Man (10)

Introduction to methods used in the study of drug metabolism, including Viktora, Mauger§, Rzeszotarski||, Wolff

* Dr. Czarnecki is Chief of Cardiology at the Walter Reed General Hospital.

† Dr. Zurek is Chief of Pulmonary Disease at the Walter Reed General Hospital.

‡ Dr. Knepshild is Chief of Renal-Dialysis Service at the Walter Reed General Hospital.

§ Dr. Mauger is with the Division of Clinical Pharmacology at the Washington Hospital Center.

|| Dr. Rzeszotarski is with the Division of Clinical Pharmacology at the Washington Hospital Center.

qualitative and quantitative chromatography, thin-layer, gas liquid chromatography, electron capture, principle of mass spectroscopy. 4 seniors; 8-week elective periods. Wash. Hosp. Center (December-May)

370 Inpatient Medicine (5) Apter

Full participation in diagnostic studies and clinical management of bed patients on Medical Service. Teaching rounds, conferences. 4 seniors; 4-week elective periods. Fairfax Hosp. (December-May)

371 Arthritis and Rheumatic Diseases (5) Felts

Introduction to clinical problems in the diagnosis and treatment of arthritis and rheumatic diseases. Students will work with arthritis research group in adaptation of computer study of clinical problems. 2 seniors; 4-week elective periods. Univ. Clinic (December-May)

372 Clinical Renal Disease (5) Parrish, N. Kramer

Participation in the clinical and laboratory procedures used in the study of renal disease. Ward rounds, consultations, conferences, and seminars. 2 seniors; 4-week elective periods. D.C. Gen. and Univ. hosps. (December-May)

373 Acting Intern in Medicine (5) Corn

Each student, assigned to a patient-care ward team, functions as an intern and assumes basic responsibility, under supervision of a resident and attending physician, for the management of approximately six patients. Participation in case presentation; scheduled conferences. 8 seniors; 4-week elective periods. D.C. Gen. Hosp. (December-May)

375 Studies in Hypertension (5) Tamagna

Participation in care of inpatients and outpatients and in research projects. 1 senior; 4-week elective periods. Univ. Hosp. and Clinic (December-May)

376 Total Patient Care (5) Tamagna

Participation in teamwork program for total patient care, including clinical and psychological studies and rehabilitation; conferences, research. 1 senior; 4-week elective periods. Univ. Hosp. and Clinic (December-May)

377 Hepatic and Metabolic Diseases (5) Ticktin

Participation in clinical studies of patients with hepatic and pancreatic diseases; endoscopy, splenoportography, liver biopsy; research in enzymes and ammonia metabolism in hepatic diseases. 2 seniors; 4-week elective periods. Univ. Hosp. (December-May)

378 Endocrinology and Cancer Chemotherapy (5) Alpert

Clinical work; emphasis on endocrinology (and metabolism) or cancer chemotherapy, depending on the student's choice. 2 seniors; 4-week elective periods. Univ. Clinic (January 31-March 26)

379 Hepatic Diseases (5) Finkelstein

Full participation in clinical program involving evaluation and management of patients with all types of hepatobiliary disease using routine and specialized techniques; teaching rounds, clinical and research seminars. Additional clinical or laboratory research experience encouraged. 2 seniors; 4-week elective periods. V.A. Hosp. (December-May)

- 380 Clinical Application of Tissue Immunology (5)** N. Kramer
Application of immunologic methods to study of human hypersensitivity states and metabolic diseases; serum proteins, including protein hormones and enzymes; research principles and methods. 1 senior; 4-week elective periods. Univ. Hosp. (December-May)
- 382 Clinical Cardiopulmonary Physiology (10)** Masumi
Clinical and laboratory evaluation of cardiac and pulmonary problems; training in ECG, phonocardiography, cardiac catheterization, angiocardiology, pulmonary function testing. Research encouraged. 1 senior; 8-week elective periods. D.C. Gen. Hosp. (December-May)
- 383 Laboratory Studies of Human Respiratory Viruses (10)** Perkins
Participation in a research program involving the characterization of new respiratory viruses; study of the role of nasal secretory antibody in upper respiratory disease. 1 senior; 8-week elective periods. N.I.H. (December-May)
- 386 Inpatient Medicine and Medical Emergencies (5)** Curtin, Bacos
Assignments to Intensive Care Unit and Emergency Room; ward rounds and conferences, radiologic and pathologic follow-up; library assignments. 2 seniors; 4-week elective periods (extended by arrangement). Wash. Hosp. Center (December-May)
- 387 Renal Diseases (5 or 10)** M. Jacobson
Hospital and office consultations; care of patients with renal disease, fluid, and electrolyte problems; renal function studies as applied to patient care; participation in renal conferences at University Hospital. 1 or 2 seniors; 4- or 8-week elective periods. (January 31-May 21)
- 388 Experience in Allergy (15)** H. Brown
Clinical experiences in allergy; work-up of patients, skin testing, immunization. Immunology of allergy—conjunctival testing, patch testing, passive transfer, histamine release, gel diffusion, tissue culture. 2 seniors; 12-week elective periods. Univ. Clinic (December-May)
- 391 Clinical Cardiology (10)** Siu and Staff
Training in clinical cardiology with individual optional emphasis on hospital and office patient care, experience in the Coronary Care Unit, Heart Station, hypertension studies, exercise ECG laboratory. Catheterization laboratory and when possible a study project. 12 seniors; 8-week elective periods. Univ. Hosp. and Clinic (December-May)
- 392 Family Practice Preceptorship (5)** J.P. Anderson*
Preceptorship in small urban community family practice. 1 senior; 4-week elective periods. Waynesboro, Va. (December-May)
- 393 Clinical Hematology (5)** Corn
Clinical and laboratory studies of patients with hematologic disorders; bone marrow and peripheral blood smears, hemoglobin electrophoresis, evaluation of coagulation mechanism. 1 senior; 4-week elective periods. D.C. Gen. Hosp. (December-May)
- 395 Metabolic Disorders in Diabetes (5)** Penhos
Intensive and practical studies of the technique to produce surgical, chemical, and hormonal diabetes. Participation in research on carbohydrate,

* Dr. Anderson is in private practice in Waynesboro.

protein, and lipid metabolism; insulin secretion in isolated organ perfusions. Seminars and participation in Journal Club. 4 seniors; 4-week elective periods. V.A. Hosp. (December-May)

396 Research in Endocrinology (5)

Penhos

Participation in endocrine research, including laboratory experience, experimental surgery, biochemical methods, and *in vivo* and *in vitro* endocrine studies. Weekly seminars and discussions will correlate experimental results with clinical observations. 4 seniors; 4-week elective periods. V.A. Hosp. (December-May)

398 Introduction to Cardiology (5)

Bacos

Clinical cardiology, correlating bedside approach to cardiovascular diagnosis with special diagnostic studies, including phonocardiography, atrial electrocardiography, cardiac catheterization, angiocardiology. 1 senior; 4-week elective periods. Wash. Hosp. Center (December-May)

399 Research in Sulfur Amino Acid Metabolism (10)

Finkelstein

Investigation of factors regulating methionine metabolism in mammalian liver utilizing assays of enzyme activity, *in vitro* hepatic perfusion, and *in vivo* metabolic studies. 1 senior; 8-week elective periods. V.A. Hosp. (December-May)

Microbiology

Professors Mary Louise Robbins, R.C. Parlett (*Chairman*), Rudolph Hugh
 Professorial Lecturers F.B. Gordon (*Virology*), Dorothy Heilman (*Cellular Immunology*) M.S. Legator (*Microbial Genetics*), E.M. Lerner II, L.J. Griffith
 Associate Professors L.F. Affronti, Melvin Reich
 Assistant Professors G.L. Wright, Jr., Yang-Ming Chu, Kun-yen Huang
 Assistant Professorial Lecturers P.J. Price, Rosalie De Giovanni-Donnelly

***201 Medical Microbiology (6)**

Parlett and Staff

For medical students; open to qualified graduate students. Bacteria, rickettsiae, viruses, yeasts, molds, protozoa, metazoa which relate to the health and disease of man—cultural studies, methods of diagnoses, theories. Laboratory fee for nonmedical students, \$16. (Spring)

214 Tissue Cell Culture and Somatic Variation (4)

Chu, Price

Techniques of tissue culture and means of studying somatic variations. Prerequisite: Micr 201 or equivalent. (Spring)

219-20 Scientific Writing for Graduate Students (1-1)

Robbins

Required of all graduate students prior to writing a thesis or dissertation. (Academic year)

221 Methods of Scientific Presentation for Graduate Students (1)

Wright

Photography and graphic arts presentation of research data for publication and scientific meetings. Prerequisite: Micr 219-20. Laboratory fee, \$16 (Fall)

* Required for medical students.

- 225 Microbial Physiology I (3)** Affronti, Reich
Morphology and biochemistry of various microorganisms with emphasis on bacteria. Prerequisite: Bioc 201, Micr 201. (Fall)
- 226 Microbial Physiology II (3)** Affronti, Reich
Effects of physical and chemical agents on microorganisms with emphasis on antibiotics. Prerequisite: Micr 225 or permission of instructor. (Spring)
- 230 Immunology (4)** Wright
Fundamental immunologic concepts. Serologic and immunologic procedures as applied to clinical and research situations emphasized in the laboratory. Prerequisite: Micr 201 or equivalent. Laboratory fee for non-medical students, \$16. (Fall)
- 231 Cellular Immunology (2)** Parlett, Wright
Study of immunological functions of reticulo-endothelial tissues, theories of autoimmunity, graft rejection, tumor immunity, delayed hypersensitivities, and heritable immunogenic defects. (Fall)
- 233 Molecular Biology of Viruses (4)** Robbins, Huang
Biochemical and genetic characterization of viruses. Prerequisite: Micr 201 or equivalent. Laboratory fee for nonmedical students, \$16. (Fall)
- 235 Systematic Bacteriology (2)** Hugh
History of bacterial classification, international rules of nomenclature as applied to bacteria, development of bacterial classification based upon relationships, survey of characteristics of bacterial groups. Prerequisite: Micr 201 or equivalent. (1972-73 and alternate years: fall)
- 251 Bacteriology (2)** Hugh
Primarily elective course for medical students; open to graduate students. Clinical situations involving bacteriology. Prerequisite: Micr 201 or equivalent. (Fall)
- 255 Virology (2)** Huang, Robbins
Primarily elective course for medical students; open to graduate students. General principles of virology; emphasis on clinical situations. Prerequisite: Micr 201 or equivalent (Fall)
- 257 Experimental Immunochemistry (3)** Wright
Biochemical and physiochemical characterization of antigens and antibodies. Prerequisite: Bioc 221-22 or equivalent, Micr 230. Laboratory fee for nonmedical students, \$16. Limited enrollment. (1971-72 and alternate years: spring)
- 258 Microbial Genetics (2)** De Giovanni-Donnelly, Legator
Survey of microbial systems that depict basic concepts of genetic principles. Prerequisite: Micr 201 or equivalent. (Spring)
- 277-78 Seminar: Microbiology (1-1)** Staff
Required of all graduate students. (Academic year)
- 280 Virology (10)** Robbins
Selected problems; library assignments, laboratory studies. 4 seniors, 8-week elective periods. School of Medicine (December-May)

- 281 **Bacterial Physiology** (5) Reich
Selected problems; library assignments, laboratory studies. 5 seniors; 4-week elective periods. School of Medicine (December-May)
- 282 **Immunology** (5) Parlett
Research problems. 3 seniors; 4-week elective periods. School of Medicine (December-May)
- 283 **Bacteriology** (10) Hugh
Selected problems; library assignments, laboratory studies. 2 seniors; 8-week elective periods. School of Medicine (December-May)
- 284 **Microbial Genetics** (5) De Giovanni-Donnelly
Research problems. 3 seniors; 4-week elective periods. School of Medicine (December-May)
- 285 **Immunologic Characterization of Cell Lines in Tissue Culture** (10) Chu, Price
Preparation of specific antigens from a cell strain and production of antibodies against this strain in appropriate mammalian host; identification of unknown cell types using tissue culture, serology, immunochemistry. 2 seniors; 8-week elective periods. (December-May)
- 286 **Diploid Cell Lines in Tissue Culture** (10) Chu, Price
Mammalian cells growing on glass surfaces in various media, staining chromosomes and determining chromosome pattern and number, methods of cell preservation such as liquid nitrogen freezing. 2 seniors; 8-week elective periods. (December-May)
- 287 **Transformation of Cells in Tissue Culture** (10) Chu, Price
Conversion of normal cell lines in tissue culture to heteroploid cell lines, demonstration of cancerous nature of transformation by inoculation of hamster cheek pouch. Polyoma virus and SB 40 used with various cell types, including human embryo. 2 seniors; 8-week elective periods. (December-May)
- 293 **Special Topics in Microbiology** (arr.) Staff
Selected topics in microbiology. May be repeated for credit. (Fall and spring)
- 295 **Research in Microbiology** (arr.) Staff
Content differs each time the course is offered; may be repeated for credit. (Fall and spring)
- 299-300 **Thesis Research** (3-3) Staff
(Fall and spring)
- 398 **Advanced Reading and Research** (arr.) Staff
Limited to students preparing for the Doctor of Philosophy general examination. May be repeated for credit. (Fall and spring)
- 399 **Dissertation Research** (arr.) Staff
Limited to Doctor of Philosophy candidates. May be repeated for credit. (Fall and spring)

Neurological Surgery

Clinical Professors J.M. Williams, H.V. Rizzoli (*Acting Chairman*), H.H. Ammerman

Associate Professor J.L. Fox

Associate Clinical Professors J.P. Murphy, L.G. Kempe, N.H. Horwitz

Assistant Professor Emanuele Mannarino

Assistant Clinical Professors G.M. Swain, Ruth Jakoby, A.P. Hustead, T.H. Milhorat, W.M. Hammon

Clinical Instructors R.A. Mendelsohn, J.W. Barrett, C.P.H. Carroll, F.D. Cooney

*301 Neurological Surgery (1)

Clinical lectures and demonstrations dealing with form and function of nervous system. Transition between basic sciences and neurologic surgery stressed and correlated. (Fall)

†380 Clinical Neurology and Neurosurgery (5)

Clinical clerkship in neurology and neurosurgical service. Emphasis on neurologic examination; indications for special neurologic tests, e.g., arteriograms, pneumoencephalograms, etc.; and operative procedures. 2 seniors; 4-week elective periods. Univ. Clinic (December-May)

381 Clinical Neurosurgery (5)

Participation in all departmental activities: ward rounds, daily conferences, radiographic and pathologic studies, operating room procedures; emphasis on studies of cerebral circulation. 2 seniors; 4-week elective periods. Walter Reed Gen. Hosp. (December-May)

385 Clinical Neurosurgery (5)

Clinical clerkship will include experience with diagnostic procedures: arteriograms, pneumoencephalograms, myelograms, and assisting in operating room; conferences and ward rounds. 1 senior; 4-week elective periods. V.A. Hosp. (December-May)

387 Clinical Neurosurgery (5)

Participation in all departmental activities, including ward rounds, daily conferences, radiographic and pathologic studies, and operating room procedures. 2 seniors; 4-week elective periods. Wash. Hosp. Center (December-May)

Neurology

Professors Harold Stevens, Sean O'Reilly (*Chairman*), M.J. Malone

Clinical Professors R.H. Groh, W.K. Engel

Professorial Lecturers K.M. Earle, N.P. Goldstein

Associate Clinical Professors A.S. Dekaban, Franklin Meister, H.H. Schwamb, Antonio Stazio

* Required for medical students.

† An interdepartmental course offered by the departments of Neurological Surgery and Neurology.

Assistant Professors M.N. Ozer, Mary Coleman, Ann Barnet, J.S. Haller, Karin Nelson

Assistant Clinical Professors G.D. Weickhardt, Ntinos Myrianthopoulos, Virginia Duggins, Cosimo Ajmone Marsan

Clinical Instructors M.C. Korengold, R.H. Robertson, Kristof Abraham, E.C. Wilner, Miryam Davis, Howard Silby

***301 Neurology (1)**

O'Reilly, Stevens

Clinical lectures and demonstrations dealing with form and function of nervous system. Transition between basic sciences and clinical neurology stressed and correlated. (Fall)

†380 Clinical Neurology and Neurosurgery (5)

O'Reilly, Stevens, Ammerman

Clinical clerkship in neurology and neurosurgical service. Emphasis on neurologic examination; indications for special neurologic tests, e.g., arteriograms, pneumoencephalograms, etc.; and operative procedures. 2 seniors; 4-week elective periods. Univ. Hosp. (December-May)

382 Pediatric Neurology (5)

Malone and Staff

Clinical clerkship in diagnostic study and care of inpatients and outpatients; conferences and teaching sessions. 2 seniors; 4-week elective periods. Children's Hosp. (December-May)

383 Clinical Neurology (5)

Schwamb

Emphasis on neurological examination and basic sciences, including neuroanatomy, as applied to clinical material. 2 seniors; 4-week elective periods. Walter Reed Gen. Hosp. (December-May)

386 Clinical Neurology (10)

Goldstein

Clinical clerkship under close supervision of highly experienced clinicians and teachers. Trainees prepare histories and conduct physicals, attend rounds and conferences, assist in routine procedures. Abundant clinical material available. 2 seniors; 8-week elective periods. Mayo Clinic (December-May)

Obstetrics and Gynecology

Professors John Parks, R.H. Barter, J.G. Sites (*Chairman*)

Clinical Professors S.M. Dodek, J.A. Dusbabek, J.K. Cromer

Associate Professors Benny Waxman, Larry McGowan

Associate Clinical Professors C.K. Fraser, W.T. Lady, W.P. McKelway, J.W. Pearson, Jr., Shirley Martin, M.S. Kaufman, M.P. Footer, Donald Walters,

Assistant Professors B.W. Richwine, Peter Soyster

Assistant Clinical Professors C.B. Jacobson, J.L. Marlow

Shea, G.L. Jarvis, N.J. Price, J.C. Walsh, L.M. Liverett, H.P. Treichler,

W.H. Cooper, I.W. Rovner, M.W. Sandmeyer, Jr., N.M. Tart, R.B. Nelson,

Louis Goldstein, George Speck, A.W. Winshel, R.V. Erkenbeck, L.Q. Pugs-

* Required for medical students.
† An interdepartmental course offered by the departments of Neurology and Neurological Surgery.

ley, H.L. Kotz, O.I. Dodek, Jr., H.A. Donald, Julius Fogel, A.I. Robins, R.E. Rogers
Instructor L.F. Arias-Bernal
Clinical Instructors A.S. Bright, Elizabeth Crisp, S.M. Belinsky, E.E. Gahres, D.R. Carlson, E.E. Cunningham, Geraldine Paul, M.H. Hird, S.F. Stewart, Jr., Josiah Sacks, R.E. Badwey, G.R. Hewlett, E.W. Titus, Jr., T.H. Gresinger, J.M. Close, E.R. Kolvereid, D.M. Margulies, J.C. Skilling, S.D. Cooley, L.E. Fettig, R.W. Smith, W.D. Wallace, Jr., P.H. Perkins, R.M. Regan, B.A. Band, C.E. Townsend, D.H. Martin, W.R. Perkins, L.C. Radice, J.E. Anderson, A.A. de Moya, C.J. Gueriera, Martin Bertman, Erika Latchis, D.C. Meek, A.A. Becker, C.D. Lord, H.C. Beaver, Carlena Campbell, Meyer Rosenbaum

***301 Obstetrics and Gynecology (2)**

Sites, Waxman

Lectures and demonstrations covering entire field; emphasis on clinical management. (Spring)

***303 Clinical Obstetrics and Gynecology (10)**

Staff

Participation in all obstetrical and gynecological clinics, daily departmental conferences and ward rounds at University, Fairfax, and Columbia hospitals. Manikin demonstrations of mechanism of labor and various types of operative delivery. (Fall)

351 Introduction to Clinical Practice (1)

C. Jacobson

Introduction of first-year medical students to patient situations by members of the clinical staff. Designed to stimulate questions and discussions regarding physical, financial, and moral implications of medical practice. 25 students. Univ. Hosp. (Spring)

376 Clinical Obstetrics and Gynecology (3)

McKelway, Titus

Participation in office practice of obstetrics and gynecology. 1 senior; 4 week elective periods. (December-May)

377 Clinical Obstetrics and Gynecology (5)

Cooper

Participation in office practice of obstetrics and gynecology. 1 senior; 4 week elective periods. (December-May)

378 Clinical Obstetrics and Gynecology (5)

Pugsley, Cooley

Participation in office practice of obstetrics and gynecology. 1 senior; 4 week elective periods. (December-May)

379 Clinical Obstetrics and Gynecology (5)

Footer, Friedman

Participation in office practice of obstetrics and gynecology. 1 senior; 4 week elective periods. (December-May)

380 Gynecologic Oncology (10)

McGowan

Participation in the clinical inpatient and outpatient care of women with gynecologic cancer; related research in the areas of cytology. 1 senior; 8 week elective periods. Univ. Clinic (December-May)

381 Clinical Obstetrics and Gynecology (5)

Waxman, Sites

Participation in office practice of obstetrics and gynecology. 2 seniors; 4 week elective periods. Univ. Clinic (December-May)

* Required for medical students.

- 383 Clinical Obstetrics (5)** Nelson, Fraser
Includes prenatal clinics, lying-in periods, delivery and postpartum care; rounds, conferences, seminars. 2 seniors; 4-week elective periods. Wash. Hosp. Center (December-May)
- 384 Clinical Gynecology (5)** Cromer, Gahres
Case assignments, rounds and conferences, including tumor board; gynecologic pathology, preparation for surgery, attendance at surgery, post-operative care. 2 seniors; 4-week elective periods. Wash. Hosp. Center (December-May)
- 385 Clinical Obstetrics and Gynecology (5)** Price, Treichler
Participation in office practice of obstetrics and gynecology. 1 senior; 4-week elective periods. (December-May)
- 386 Inpatient Obstetrics and Gynecology (5)** Rogers
Supervised instruction in large military hospital; rounds and conferences. 4 seniors; 4-week elective periods. Walter Reed Gen. Hosp. (December-May)
- 387 Clinical Obstetrics and Gynecology (5)** Cooper, Walters, Jarvis
Participation in patient care; rounds and conferences. 2 seniors; 4-week elective periods. Sibley Memorial Hosp. (December-May)
- 388 Clinical Obstetrics and Gynecology (5)** Price
All aspects of inpatient and outpatient obstetrical and gynecologic services; rounds, obstetrical-gynecologic conferences, gynecologic pathology conferences; obstetrical anesthesia; Emergency Room consultations. Home visits to selected patients with Health Department Nurse. 2 seniors; 4-week elective periods. Fairfax Hosp. (December-May)
- 389 Clinical Obstetrics and Gynecology (5)** Marlow
Participation in patient care, rounds, and conferences. 2 seniors; 4-week elective periods. Columbia Hosp. (December-May)
- 391 Cytogenetics (1)** Arias-Bernal
Clinical chromosomal anomalies in man, experimental design and data analysis in cytogenetics, two cytogenetics techniques, sex chromatin analysis, tissue culture procedures. Special students admitted with approval of instructor. (1972-73 and alternate years: fall)
- 392 Reproductive Genetics (1)** C. Jacobson
For medical students; open to graduate students with permission of instructor. Lectures with guest speakers, covering current methodology. Emphasis on human infertility; clinical case presentation and review utilized whenever possible. Major topics: gametogenesis, *in vivo* gamete manipulation and fertilization, nidation, and selective factors in development. 20 sophomores. Univ. Hosp. (Fall)
- 395 Gametogenesis (1)** C. Jacobson
For medical students; open to graduate students with permission of instructor. Seminar course with guest lecturers. Covers various clinical and experimental factors in gametogenesis. Emphasis on histogenesis of the gonads, environmental and clinical variables in infertility. 25 1st-year medical students. Univ. Hosp. (Spring)

399 Medical Genetics (1)

C. Jacobson

Clinical examples of genetic disease. Emphasis on basic principles such as linkage, heterogeneity, mutation, and pedigree inheritance. The goal of the course is to provide the knowledge and skills needed to diagnose, manage, and counsel common genetic disorders. (1972-73 and alternate years: fall)

Ophthalmology

Professor M.F. Armaly (Chairman)

Clinical Professors F.D. Costenbader, J.H. King, Jr., L.C. Moss, Benjamin Rones, M.M. Parks, M.G. Alper

Associate Clinical Professors R.W. Wilkinson, B.S. Fine

Assistant Professor D.S. Friendly

Assistant Clinical Professors W.J. Romejko, W.P. Chalfant, Jr., R.E. duPrey, Robert Day, J.H. Lodge, W.B. Glew, J.T. Schwartz, K.A. Simon, H.A. Urweider, B.H. Zeavin, M.O. Ts'o, H.N. Bernstein, D.K. Berler, J.N. Goldman, A.L. Fjordbotten, W.S. Gilbert, H.S. Wicker

Instructors Dertad Manguikian, K.R. Rao, Minoru Araki (Research)

Clinical Instructors J.R. Weimer, Stephen Pappas, Joanne Economon, R.S. Deitch, H.I. Rodman, George Liss, H.M. McAllister, L.E. Perraut, Victor Preziosi, H.J. Starr, M.H. Zimmerman, Leonard Kogan, J.F. Nowell, Bernard Ehrlich, D.L. Lanter, Richard Huberman, P.A. Dorn, Jr., E.M. Zimmerman, Joseph Snyder

281 Ophthalmic Pathology I (1)

L. Zimmerman

Basic science aspects of diseases of the eye. (Spring)

282 Ophthalmic Pathology II (3)

L. Zimmerman

Diseases of the eye as revealed by gross and microscopic examination. 8 students. Armed Forces Inst. of Path. (Spring)

284 Ophthalmic Pathology III (5)

L. Zimmerman

Daily participation in an active service limited to pathology of the eye and its adnexa. Inflammatory, degenerative, and neoplastic diseases comprise the major categories. 1 senior; 4-week elective periods. Armed Forces Inst. of Path. (Spring)

***301 Ophthalmology (1)**

Staff

Basic principles of medical and surgical ophthalmology and neuro-ophthalmology. (Fall)

***302 Ophthalmology (OPD)(1)**

Lodge

Clinical instruction in external examination of the eye; tonometry and funduscopy. Use of ophthalmological instruments. (Fall)

380 Clinical Ophthalmology (5)

Lodge and Staff

Students will observe all types of eye conditions in ambulatory and hospitalized patients. 3 seniors; 4-week elective periods. Wash. Hosp. Center (December-May)

* Required for medical students.

Orthopaedic Surgery

Professors J.P. Adams (*Chairman*), H.L. Feffer (*Associate Chairman*), P.P. Griffin

Clinical Professors J.S. Neviasser, L.T. Peterson

Associate Professor Peter Kenmore

Associate Clinical Professors Charles Keck, R.L. Dow

Assistant Clinical Professors C.W. Metz, Jr., Byron Genner III, G.J. Scholz, G.I. Baker, S.H. Eisenberg

Instructor W.P. Fortune

Clinical Instructors Frances Brennecke, H.E. Lane, Jr., K.A. Peterson, L.A.

Ottenritter, Ronald Ottenberg, E.L. Radin, H.S. Cattell, A.I. Dobranski

(*Anatomy*), B.P. Vitek, Stanford Lavine, C.T. McCullough, Jr., Richard

Conant, Ulla Fortune, J.W. Harvey

*302 Clinical Clerkship in Orthopaedic Surgery

Two weeks at either the V.A. or University Hospital.

380 Orthopaedic Surgery (5)

Adams and Staff

Rotating program: one week of adult orthopaedics at University Hospital; one week of children's orthopaedics at D.C. General Hospital or Children's Hospital; one week of general orthopaedics at Walter Reed General Hospital or Andrews Air Force Base Hospital. 2 seniors; 4-week elective periods. (December-May)

381 Orthopaedic Surgery (5)

Kenmore

Participation in total care program of orthopaedic patients: daily rounds, conferences, seminars. 2 seniors; 4-week elective periods. V.A. Hosp. (December-May)

391 Extramural Orthopaedic Surgery (5 to 20)

Adams

By special arrangement of the Chairman of the Department, an extramural elective open to seniors for a period of from 4 to 16 weeks.

Otolaryngology

Associate Clinical Professor J.J. McFarland, Jr. (*Chairman*)

Assistant Clinical Professors J.L. Levine, M.E. Krucoff, R.S. Page, Jr., J.A.

Sabri, W.M. Tribble, B.M. Webb, R.L. Fields, R.E. Pumphrey, Jr.

Clinical Instructors I.S. Jaffee, R.D. Ralph, H.H.E. Scheidemandel, G.F. Miller, Jr., D.N.F. Fairbanks

380 Otolaryngology (5)

McFarland

Care of inpatients and outpatients, diagnosis, and therapy; rounds and conferences. 8 seniors; 4-week elective periods. Wash. Hosp. Center. (December-May)

* Required for medical students. Credit is a part of and is assigned after completion of Surg 304.

Pathology

Professors T.M. Peery (*Chairman*), W.R. Duryee (*Research—Experimental*), F.N. Miller, Jr., William Newman, J.C. Smith
Clinical Professors L.E. Zimmerman (*Ophthalmic*), J.M. Blumberg, E.B. Helwig (*Dermatologic*), G.H. Reifenshtein, N.S. Irely, Robert Sauer (*Comparative*), Cornelia Hoch-Ligeti
Professorial Lecturers Mary Matthews, P.D. Olch (*History of Medicine*)
Associate Professors W.L. Marsh, Lois Platt (*Cytology*), Alexander Breslow, F.S. Jannotta
Associate Clinical Professors V.E. Martens, Theodore Winship, R.E. Palmer, W.J. Jaffurs
Assistant Professors S.G. Kent, Suzanne Hammersberg (*Medical Technology*), B.C. Zook (*Comparative*)
Assistant Clinical Professors W.F. Enos, Marjorie Williams, C.B. Cook, D.R. Parkinson, I.D. Godwin, M.A. Weinberger, Floris Garner (*Comparative*), Gloria Brennan
Special Lecturer L.C. Johnson

115-16 Introduction to Medical Science (1-1)

Marsh, Hammersberg, and Staff

Lectures for medical technology students on physiology, pathology, and medicine to accompany Path 119-20. (Academic year—1 hour a week)

117-18 Principles in Medical Technology (4-4)

Marsh, Hammersberg, and Staff

For medical technology students. Theories, principles, sources of error of methods used in clinical chemistry, clinical bacteriology, serology, hematology, clinical microscopy. (Academic year—4 hours a week)

119-20 Medical Technology Laboratory (10-10)

Marsh, Hammersberg, and Staff

Rotation through University Hospital pathology laboratories: hematology and urinalysis, 12 weeks; chemistry, 12 weeks; bacteriology and parasitology, 12 weeks; blood bank, 6 weeks; serology, 4 weeks; tissue pathology, 4 weeks. (35 hours a week for 50 weeks)

*†201 Pathology (8)

Inflammations, degenerations, malformations, trauma, neoplasms. Pathology of organ systems; correlation with symptoms and physical signs. Gross and microscopic study of diseased tissues. Case studies. (Fall—12 hours a week)

*202 Diagnostic Conferences (1)

Case studies demonstrating pathologic significance of major clinical symptoms and physical signs. (Spring—1 hour a week)

*203-4 Clinicopathologic Conferences (0)

Case histories presented and differential diagnosis discussed; clinical, laboratory, necropsy findings correlated. (Fall and spring during medical clerkship)

* Required for medical students.

† Open to limited number of graduate students, with permission.

- 252 **Forensic Pathology and Medical Jurisprudence (1)** Miller
Somatic death, coroner and medical examiner systems, pathology of physical and chemical injuries, medical licensure; the physician-patient relationship and professional liability are discussed. (Spring—1 hour a week)
- 253 **Medicine in Shakespeare (1)** Miller
Seminars with student and staff presentations covering the plays of William Shakespeare of medical significance. (Spring—1 hour a week)
- 254 **Medicine in Literature (1)** Miller
Series of discussions with student and staff presentations covering novels, dramas, nonfiction, and poetry of medical significance. (Fall—1 hour a week)
- 260 **Obstetric and Gynecologic Pathology (1)** Jaffurs
Organ changes in normal and abnormal pregnancy, including both the mother and the fetus. Diseases of female genital system. (Spring—1 hour a week)
- *262 **Problems in Experimental Cellular Pathology (1)** Duryee
Cytological and biochemical aspects of cellular function in relation to normal and selected pathological conditions. (Spring—1 hour a week)
- 264 **Clinicopathologic Discussions (1)** Smith, Jannotta
Formal clinicopathologic conferences alternating with systematic review of autopsied cases from the medical service. Univ. Hosp. (Spring—1 hour a week)
- *266 **Comparative Pathology I (1)** Sauer, Zook
Participation in an autopsy service involving wild animals in captivity, comparison of diseases in various animal species with those in man. Limited to 4 students. Path Lab., Nat'l Zoological Park (Spring—four 3-hour sessions)
- *271 **Tissue Reactions to Drugs (1)** Irey
Study of the problems involved in recognizing instances of untoward reaction to therapy. Case presentations. (Spring—1 hour a week)
- 272 **Pathology in Medicine and Surgery (2)** Reifenstein
Survey of current literature, with application of pathology to clinical medicine and surgery. Each student assigned an article a week, for study, written report, and group critique. (Spring—2 hours a week)
- 274 **Medical Pathology (2)** Staff
Study of cases from the necropsy service at University Hospital, evaluating and interpreting gross and microscopic tissue changes and correlating them with clinical data. (Spring—2 hours a week)
- *276 **Seminars in Pathology (2)** Peery and Staff
Conferences on current topics in pathology, conducted by and primarily for residents in pathology. Each student teams up with a resident to prepare and present a seminar on a selected topic. Univ. Hosp. (Spring—2 hours a week)

* Open to limited number of graduate students, with permission.

- 279 Ophthalmic Pathology I (1)** Zimmerman
Basic science aspects of diseases of the eye. (Spring—1 hour a week)
- 280 Surgical Pathology I (4)** Newman
Surgical pathology service at University Hospital and Washington Hospital Center. Examining specimens from current surgical cases, correlating with clinical manifestations. Univ. Hosp. and Wash. Hosp. Center (Spring—6 hours a week)
- 282 Ophthalmic Pathology II (3)** Zimmerman
Diseases of the eye as revealed by gross and microscopic examination. Concurrent requisite: Path 279. 6 students. Armed Forces Inst. of Path. (Spring—4 hours a week)
- *283 Anatomical Pathology Clerkship (5 or 10)** Staff
Necropsy and surgical pathology service. Prerequisite: Path 201. Graduate students receive 5 semester hours of credit for each 4-week period and may receive up to 30 semester hours of credit for 6 months full-time. (Medical students: 3 seniors; 4- or 8-week elective periods; December–May. Graduate students: fall or spring.)
- 284 Ophthalmic Pathology III (5)** Zimmerman
Daily participation in service limited to pathology of the eye and its adnexa. 1 senior; 4-week elective periods. Armed Forces Inst. of Path. (December–May)
- 285 Clinical Pathology I (10)** Martens
Selected techniques of clinical chemistry, hematology, bacteriology. Student selects laboratory problem. 4 seniors; 8-week elective period. Wash. Hosp. Center (January 31–March 26)
- 287 Clinical Pathology II (5)** Marsh, Kent
Techniques in the clinical laboratory and interpretation of results, follow-up studies. 1 senior; 4-week elective periods. Univ. Hosp. (December–May)
- 288 Clinical Cytology (5)** Platt
Evaluation of cytologic smears, chiefly vaginal, as a screening procedure in cancer diagnosis. 1 senior; 4-week elective periods. Warwick Bldg. (December–May)
- 290 Clinical and Anatomical Pathology I (5)** Cook
Daily studies of surgical and necropsy pathology, including forensic pathology; clinical pathology projects, including hematology, isotopology, bacteriology. 1 senior; 4-week elective periods. Fairfax Hosp. (December–May)
- 291 Experimental Cell Pathology: Cancer Research (5)** Duryee
Experimental animal tumors; tissue culture, histological and cytological techniques, library assignment. 1 senior; 4-week elective periods. Warwick Bldg. (December–May)

* Open to limited number of graduate students, with permission.

292 Experimental Pathology: Enzymatic Changes in Human Tissues (5) Hoch-Ligeti

Distribution and concentration of lactic dehydrogenase, beta glucuronidase, and their isoenzymes in human tissues; limited participation in routine studies in pathology. Room and board furnished. 2 seniors; 4-week elective periods. V.A. Center, Martinsburg, W.Va. (February 28–April 23)

293 Clinical and Anatomical Pathology II (5) Palmer

Participation in departmental activities, including clinical, surgical, and autopsy pathology; medico-legal autopsies. 1 senior; 4-week elective periods. Alexandria Hosp. (December–May)

294 Surgical Pathology II (5)

Preoperative examination of patients with tumors, pathologic examination of excised lesions; teaching conferences. 2 seniors; 4-week elective periods. Wash. Hosp. Center (December–May)

296 Surgical Pathology III (5) Newman

For graduate students. Participation in veterinary pathology service, including wild and domestic animals. Prerequisite: Path 201. Five semester hours of credit for each 4-week period. Students may receive up to 30 semester hours of credit for 6 months full-time. Armed Forces Inst. of Path. (Fall or spring)

296 Surgical Pathology IV (5) Newman

Evaluation of surgical specimens and correlation with clinical status of patient, description of gross and microscopic findings on assigned cases. 2 seniors; 4-week elective periods. Univ. Hosp. (December–May)

297 Dermal Pathology (5) Helwig

Microscopic conferences, review of current material and study sets. 2 seniors; 4-week elective periods. Armed Forces Inst. of Path. (December–May)

298 Necropsy Pathology (5) Jannotta, Breslow

Organ changes in disease, gross and microscopic examinations, preparation of protocols. 2 seniors; 4-week elective periods. Univ. Hosp. (December–May)

299–300 Thesis Research (3–3) Staff

(Fall and spring)

398 Advanced Reading and Research (arr.) Staff

Limited to students preparing for the Doctor of Philosophy general examination. May be repeated for credit. (Fall and spring)

399 Dissertation Research (arr.) Staff

Limited to Doctor of Philosophy candidates. May be repeated for credit. (Fall and spring)

Pediatrics

- Professors* R.S. Lourie (*Psychiatry*), F.P. Heald, R.H. Parrott (*Acting Chairman*), Spyros Doxiadis (*Visiting*), S.L. Leikin, J.C. Houck (*Biochemistry*)
A.M. Margileth (*Associate Chairman*)
Clinical Professors W.S. Anderson, L.E. Hoeck, W.A. Howard, J.A. Washington, Lois Murphy (*Child Development*), Sydney Ross
Associate Professors L.P. Scott III, Margaret Gutelius, E.V. Soto, Gordon Avery, Wellington Hung, Leon Cytryn (*Psychiatry*), Dorothy Huntington (*Research—Child Development*), Rebecca Rieger (*Research—Child Development*) A.F. North, Jr., D.W. Delaney
Associate Clinical Professors T.E. Reichelderfer, William Stark (*Psychiatry*), S.I. Wolf, A.B. Coleman, Bennett Olshaker (*Psychiatry*), S.C. Southard, Belinda Straight (*Psychiatry*)
Assistant Professors J.R. Puig, Nasser Movassaghi, C.A. Rigg, W.H. Barton (*Psychiatry*), L.W. Perry, C.M. Berlin, Jr., L.M. Greenberg (*Psychiatry*), S.A. Fagen (*Research—Child Development*), Elsa Greenberg (*Research—Child Development*), Ann Lodge (*Research—Child Development*), Lovisa Tatnall (*Research—Child Development*), H.B. Richardson, Jr., Gloria Eng, G.P. August, E.N. Kraybill, M.W. Werthmann, Jr., C.D. Brandt (*Microbiology*), H.W. Kim
Assistant Clinical Professors Mabel Grosvenor, R.E. Martin, J.H. Peacock, Jr., Mary Sartwell, C.F. Stiegler, H.G. Clark, Adrian Recinos, Jr., C.R. Webb, G.J. Cohen, Stephen Mourat (*Psychiatry*), Erwin Friedman (*Psychiatry-Psychology*), A.J. Modlin, A.E. Marans (*Psychiatry*), Elma Denham (*Psychiatry*), M.S. Glatt (*Psychiatry*), Mary Robinson (*Child Development*), D.H. McKnew, Jr. (*Psychiatry*), P.C. Brunschwyler, L.A. Cove (*Psychiatry*), D.P. Devaris (*Psychiatry*), Milton Engel (*Psychiatry*), H.T. Yates, Mary Fox, H.D. Knox, B.H. Ong, H.R. Gold, V.L. Guandolo, J.L. Chamberlain III, Leonard Lefkowitz
Instructors S.I. Granger, Beneta Peacock, Anne Fletcher, Mary Flumerfelt (*Psychiatry*), Shirley McMahon, D.R. Meers (*Psychiatry*), S.G. Werner, Jane Todaro, S.R. Lane, Hiltje Irausquin (*Research—Biochemistry*), Manouchehr Rokni, Karen Olness, Eduardo Azcarate (*Psychology*)
Clinical Instructors H.H. Diamond, R.H. Mitchell, R.O. Warthen, Emilie Black, R.H. Anderson, W.G. Preisser, Roger Bergstrom, S.Z. Goldblatt, Hilary Millar (*Psychiatry*), Harold Plotsky (*Psychiatry*), Jean Lockhart, G.W. Daisley, Jr., Agnes Schweitzer, G.W. Hardman, Jr., Frances Min, Iradj Mahdavi, K.G. Kassebaum, H.W. Rice, D.A. Young, George Joseph, F.A. Pedreira, Cecilin Chisholm, S.L. Levin, Thomas Sullivan, R.M. Zakheim, M.L. Feldman, Lillian Osborne (*Psychiatry*)
Lecturer R.F. Hinckley
Special Lecturers G.A. Balfour, J.A. Bottiglione, C.J. Schulte III

*301 Pediatrics (2)

Prenatal, perinatal, postnatal factors influencing growth and development of the infant. Social, emotional, physical growth of infant and child. (Spring)

* Required for medical students.

- *303 Pediatric Clerkship (10)** Margileth and Staff
Full-time, as part of resident team; ward rounds; work in outpatient department and specialty clinics under staff supervision; child psychiatry and child guidance, lectures, clinical conferences, grand rounds. Children's Hosp. (Annual, continuous 8-week rotation)
- 375 Community Child Psychiatry (10)** Engel
The student will function as a junior psychiatric resident participating in a satellite clinic in the comprehensive care program. Experience as a member of an interdisciplinary team; participation in consultation to a community group; seminars and conferences. 2 seniors; 8-week elective periods. Morgan Clinic (December-May)
- 376 Pediatric Neurology (5 or 10)** Nelson
Participation in diagnostic and therapeutic studies on inpatients and outpatients. Rounds, conferences, and seminars. 2 seniors; 4- or 8-week elective periods. Children's Hosp. (December-May)
- 377 Community Health Development (5 or 10)** Hinckley
Acquaints the student with public health preventive and community medicine as it is conducted by the Health Department of Montgomery County, Maryland. The student will have an opportunity to work in outlying health center satellites, central pediatric specialty clinics, and to become familiar with school health programs and projects. 1 senior; 4- or 8-week elective periods. (December-May)
- 378 Care and Evaluation of Children of Drug Abusers (5)** Berlin
Extensive exposure to the drug abuse culture. Weekly clinic for evaluation of children of drug abusers. 1 senior; 4-week elective periods. Children's Hosp. and Univ. Clinic (December-May)
- 379 Developmental Neurology (5)** Richardson
Application of developmental neurology to learning problems in young school-aged children. 2 seniors; 4-week elective periods. (December-May)
- 380 Clinical Pediatrics (5)** Margileth, Puig
Full-time, as part of resident team; wards, outpatient department, and specialty clinics under staff supervision. Participation in diagnostic studies, therapeutic procedures, rounds, and conferences. 6 seniors; 4-week elective periods. Children's Hosp. (December-May)
- 381 Pediatric Allergy (10)** Howard
Introduction to pediatric allergy, clinics and wards, some experience in experimental techniques and preparation of extracts. 1 senior; 8-week elective periods. Children's Hosp. (December-May)
- 382 Pediatric Radiology (5)** LoPresti
Diagnostic and therapeutic radiology, diagnostic procedures. 2 seniors; 4-week elective periods. Children's Hosp. (December-May)
- 384 Newborn and Premature (5)** Avery, Kraybill, and Staff
Clinical studies in newborn care emphasizing hematologic problems and congenital malformations; daily rounds, conferences, research studies in cytogenetics. 2 seniors; 4-week elective periods. Univ. Hosp. (December-May)

* Required for medical students.

- 385 Child Psychiatry (5)** Greenberg
Diagnostic and follow-up studies on inpatients and outpatients; rounds, conferences, seminars; visits to related community facilities. 2 seniors; 4-week elective periods. Hillcrest Children's Center (December-May)
- 386 Pediatric Hematology (5)** Leikin
Clinical and laboratory studies of infants and children with hematologic disorders; bone marrow examinations. 1 senior; 4-week elective periods. Children's Hosp. (December-May)
- 387 Clinical Pediatrics (5)** Soto
Care of newborn and children on inpatient basis; diagnostic studies, therapy; assigned reading. 2 seniors; 4-week elective periods. Fairfax Hosp. (December-May)
- 388 Newborn Medicine (5)** Avery and Staff
Observation and participation in the care of inpatient and outpatient infants. 1 senior; 4-week elective periods. Children's Hosp. (December-May)
- 389 Pediatric Cardiology (5)** Scott, Perry
Physical diagnosis of congenital and acquired heart diseases, interpretation of electrocardiograms and vectorcardiograms, cardiac catheterizations. 2 seniors; 4-week elective periods. Children's Hosp. (December-May)
- 392 Adolescent Medicine Clerkship (5 or 10)** Rigg, Werner
Study of the normal developmental problems of adolescence. Experience in the medical care of adolescents. 2 seniors; 4- or 8-week elective periods. Children's Hosp. (December-May)
- 396 Mental Retardation (5 or 10)** Cytryn, Friedman
Diagnostic work-up of mentally retarded children and adolescents. Conferences, community resources. 2 seniors; 4- or 8-week elective periods. (December-May)
- 397 Pediatric Intensive Care (5)** Berlin
Patients with acute medical/surgical problems on the intensive care ward will be used as a stimulus for students to learn pediatric pathophysiology. Monitor equipment and tests, including electrocardiogram, respirators, blood gases, fluids, and electrolytes. 2 seniors; 4-week elective periods. Children's Hosp. (December-May)
- 398 Comprehensive Care (5 or 10)**
Participating in both sick- and well-child care as it is administered in a comprehensive setting; experience in the multidisciplinary approach; cooperative planning with other community agencies. 1 senior; 4- or 8-week elective periods. Children's Hosp. (December-May)
- 399 Morgan Clinic (5)** Granger
Participation in an observation of a community clinic operation. 1 senior; 4-week elective periods. Morgan Clinic (December-May)

Pharmacology

Professor H.G. Mandel (*Chairman*)

Professorial Lecturers B.B. Brodie, F.E. Hahn

Associate Professors V.H. Cohn, Jr., Paul Mazel, K.S. Kim (*Research*), S.E.

Fabro (*Research*), W.R. Jondorf (*Research*), J.A. Straw

Assistant Professors G.A. Hahn (*Research*), Philip Klubes, Barbara Roth-Schechter

Instructors Glenna Fitzgerald, Sau-Wah Kwan

Special Lecturer D.J. Boullin

*201 Pharmacology (8)

Mandel and Staff

Lectures, laboratory, conferences on interaction of drugs and biological systems as a basis for rational therapy of disease. Prerequisite: biochemistry and physiology, or approval of Department. (Fall)

203 Fundamental Principles of Pharmacology (2)

Staff

Basic principles of pharmacology, including drug-receptor interactions, structure activity relationships, pharmacokinetics, membrane phenomena, cellular control mechanisms, drug toxicity. (Fall)

215 Adolescent Drug Abuse: a Program for Educators (3)

Cohn and Staff

Primarily for school teachers, counselors, and administrators. Multidisciplinary lectures and discussions concerning the physiological and psychological effects of narcotics, central nervous system stimulants and depressants, alcohol, and hallucinogenic and psychedelic drugs; psychosocial factors leading to drug abuse; legal implications of drug abuse; prevention, control, and treatment of drug abuse. (Fall and spring)

252 Seminar: Clinical Pharmacology (2)

Fabro

Problems in therapeutics; emphasis on drugs used in treatment of cardiovascular, renal, and hemopoietic diseases. Enrollment limited. (1971-72 and alternate years: spring)

254 Frontiers in Pharmacology (1)

Mandel and Staff

For medical and graduate students. Recent advances and fields of research in pharmacology. Most of the material presented by laboratory scientists from neighboring institutions. (Spring)

256 Molecular Pharmacology (2)

F. Hahn

For medical and graduate students. Current theory on action of drugs, especially chemotherapeutic agents, at molecular level. Effect of drugs on biosynthetic processes of the cell with respect to DNA, messenger RNA, transfer RNA, ribosomes, protein, cell wall, and intermediary metabolites. Factors which alter action of drugs, such as drug interactions and resistance. (Spring)

258 Cancer Chemotherapy (1)

Mandel and Staff

For medical and graduate students. Mechanisms by which drugs inhibit the growth of tumor cells. (1971-72 and alternate years: spring)

* Required for medical students; open to graduate students.

- 259 Developmental Pharmacology (1)** Fabro
For medical and graduate students. Lectures, seminars, conferences. Teratogenic actions of drugs; pharmacological principles which apply during prenatal and perinatal development. (1971-72 and alternate years: spring)
- 260 Endocrine Pharmacology (1)** Kim
For medical and graduate students. Lectures and seminars on recent advances in the pharmacology and mechanism of action of various hormones. (1972-73 and alternate years: spring)
- 264 Pharmacological Research (3)** Staff
Metabolism of narcotic and nonnarcotic analgesic agents, metabolism and mechanism of action of antibiotics and anticancer drugs, protein synthesis, molecular pharmacology, pharmacogenetics, adaptation in drug metabolism. 3 sophomores. (Spring—2 half days a week)
- 267 Pharmacological Research (arr.)** Staff
For graduate students. Research with staff members. May be repeated once for credit toward a Master of Science degree. (Fall and spring)
- 269 Pharmacology Seminar (1)** Staff
For graduate students. Recent advances in pharmacology. Content differs each time the course is offered; may be repeated once for credit. (Fall and spring)
- 272 Physiological Disposition of Drugs (3)** Cohn
For medical and graduate students. Fate of drugs in biological tissue. Absorption, distribution, chemical alteration, excretion of drugs; physical, chemical, and biological factors affecting these processes. Limited to 20 students. Prerequisite: Phar 201. (1971-72 and alternate years: spring)
- 275-76 Advanced Topics in Pharmacology I-II (1-1)** Staff
Lectures and seminars on advances in mechanisms of drug action, pharmacology of new drugs, theoretical aspects of pharmacology, laboratory techniques. (1971-72 and alternate years: academic year)
- 277-78 Advanced Topics in Pharmacology III-IV (1-1)** Staff
Continuation of Phar 275-76. (1972-73 and alternate years: academic year)
- 279 Special Topics in Pharmacology (arr.)** Staff
Selected aspects of drug action. Content differs each time the course is offered; may be repeated once for credit. (Fall and spring)
- 281 Physiological Techniques in Pharmacology—Lecture (2)** Mazel, Straw
For medical and graduate students. Physiological techniques for obtaining information on mechanism and site of action of pharmacological agents. Limited to 20 students. Phar 281 may be taken without 282. Prerequisite: Phar 201. (1971-72 and alternate years: spring)
- 282 Physiological Techniques in Pharmacology—Laboratory (2)** Mazel, Straw
Accompanies Phar 281. Prerequisite: Phar 201. Prerequisite or concurrent registration: Phar 281. (1971-72 and alternate years: spring)

- 283 **Biochemical Techniques in Pharmacology** (arr.) Cohn
For graduate students. Lectures and laboratory. Theory and practice of modern biochemical techniques applicable to study of metabolic fate and mechanism of action of drugs. Prerequisite: Phar 201. (As arranged)
- 285 **Readings in Pharmacology** (1) Staff
For medical students. Assigned reading and preparation of report. (Fall and spring)
- 286 **Research in Pharmacology** (arr.) Staff
For medical students. Participation in experimental studies in pharmacology, particularly bacterial chemotherapy, cancer chemotherapy, or drug metabolism. (Fall and spring)
- 295 **Reading and Research** (arr.) Staff
Independent study for students preparing for the Master of Science degree. May be repeated for credit. (Fall and spring)
- 299-300 **Thesis Research** (3-3) Staff
(Fall and spring)
- 398 **Advanced Reading and Research** (arr.) Staff
Limited to students preparing for the Doctor of Philosophy general examination. May be repeated for credit. (Fall and spring)
- 399 **Dissertation Research** (arr.) Staff
Limited to Doctor of Philosophy candidates. May be repeated for credit. (Fall and spring)

Physiology

Professors C.S. Tidball (*Chairman*), R.A. Kenney, Elizabeth Tidball (*Research*)
 Professorial Lecturers Leonard Laster, K.R. Coburn
 Associate Professor Marie Cassidy
 Assistant Professors Elizabeth Stephenson, M.J. Jackson, R.A. Lavine, D.W. Watkins
 Special Lecturers L.L. Langley, H.J. Zimmerman

Departmental prerequisite: Phyl 201 or equivalent is prerequisite to all courses in Physiology numbered above 201.

- 191 **Selected Topics in Human Structure and Function** (3) Kenney
Lecture (2 hours), laboratory (1 hour). Structural and functional basis of physiology. A required course for graduate students who have not had Anat 201 or equivalent. Content of this course is on the undergraduate level; students may receive graduate credit on completion of additional work as prescribed by the instructor. Prerequisite: B Sc 11-12 or equivalent and consent of instructor. Open to Columbian College of Arts and Sciences students only with the approval of the student's major adviser. (Fall)

***201 Physiology (8)**

Lecture (8 hours), laboratory (2 hours), conference (1 hour). Cellular, organ system, and applied mammalian physiology. Prerequisite for graduate students: Anat 201 or Phyl 191, or equivalent; Bioc 201 or 221-22 (Bioc 222 may be taken concurrently); or consent of Chairman of Department. Nonmedical students please note that the first meeting of the course occurs one week before the start of University campus classes. Open to Consortium students only with permission of Department Chairman. (Spring) Staff

221 Seminar (1)

Staff and student presentations from literature. Present work discussed, experimental design and scientific deduction evaluated. Topics to be announced. Prerequisite: a reading knowledge of French or German. Content differs each time the course is offered; may be repeated for credit. (Fall and spring) Stephenson

251 History of Medicine (1)

Survey of the great contributors to physiology and medicine in the context of the times in which they lived and worked. (Fall) E. Tidball

252 Physiological Basis of Sexuality (1)

Conference 1 hour a week. Human reproduction, neonatal changes, contraception, sterility; their implications on patient counseling. (Fall) C. Tidball

253 Clinical Applications of Physiology (1)

Conference 1 hour a week. Emphasis on acid-base and fluid-balance physiology and its relation to clinical problems. C. Tidball

256 Aerospace Physiology (1)

Conference 1 hour a week. Discussion of physiological problems involved in aviation and space technology. (Fall) Coburn

261 Gastrointestinal Physiology (2)

Lecture or conference 2 hours a week. Physiological approach to such clinical problems as peptic ulcer, malabsorption, ulcerative colitis, hepatitis, and others. (Fall) Staff

262 Cardiovascular Physiology (2)

Lecture or conference 2 hours a week. An overview of cardiovascular physiology at an advanced level. Kenney

263 Endocrine Physiology (2)

Lecture or conference 2 hours a week. Basic physiology underlying clinical derangements involving abnormal endocrine function. Jackson

264 Basic Science in Clinical Medicine (2)

Conferences on basic and clinical research which have brought new understanding to disease states characterized by inborn errors of metabolism. (Fall) Laster

267 Renal Physiology (2)

Lecture or conference 2 hours a week. An overview of renal physiology at an advanced level. Kenney

* Required for medical students; open to graduate students.

- 271 **Electronic Instrumentation** (3) Lavine
Lecture (2 hours), laboratory (2 hours). Fundamentals of electronics and their application to the measurement of physiological phenomena. Prerequisite: Math 31; Phys 1, 2; and consent of instructor. (Fall)
- 272 **Mammalian Radiophysiology** (1) Jackson
Lecture or conference 1 hour a week. Basic physiology of radiation lethality.
- 273 **Investigative Electron Microscopy** (3) Cassidy
Lecture (2 hours), laboratory as arranged. Application of electron microscopy to biological investigative studies. Limited enrollment. Prerequisite: Anat 261 or equivalent. Admission by permission of instructor. (Fall)
- 281 **Experimental Gastrointestinal Physiology** (5) C. Tidball
2 seniors; 4-week elective periods. School of Medicine (December-May)
- 282 **Experimental Cellular Physiology** (5) Cassidy
2 seniors; 4-week elective periods. School of Medicine (December-May)
- 283 **Experimental Neuroendocrinology** (5) E. Tidball
2 seniors; 4-week elective periods. School of Medicine (December-May)
- 286 **Experimental Renal Physiology** (5) Kenney
2 seniors; 4-week elective periods. School of Medicine (December-May)
- 287 **Experimental Electron Microscopy** (5 or 10) Cassidy
2 seniors; 4- or 8-week elective periods. School of Medicine (December-May)
- 288 **Experimental Muscle Physiology** (5 or 10) Stephenson
2 seniors; 4- or 8-week elective periods. School of Medicine (December-May)
- 289 **Experimental Nutrition and Metabolism** (5) Jackson
2 seniors; 4-week elective periods. School of Medicine (December-May)
- 290 **Experimental Neurophysiology** (5) Lavine
2 seniors; 4-week elective periods. School of Medicine. (December-May)
- 295 **Research** (arr.) Staff
By special arrangement with individual Staff members. Approximately 4 clock hours in the laboratory for each semester hour credit. Content differs each time course is offered; may be repeated for credit. (Fall and spring)
- 298 **Comprehensive Physiology** (2) Staff
Guided review of selected areas of Physiology appropriate to the student's graduate program. This course satisfies the requirements for the Master's Comprehensive Examination, the Field Examination for doctoral students

minoring in Physiology, and Part I of the Cumulative General Examination in Physiology. Prerequisite or concurrent registration: Phyl 221. (Fall)

299-300 Thesis Research (3-3)
(Fall and spring)

Staff

396 Advanced Reading and Research (2)

Staff

Limited to students preparing for the Doctor of Philosophy general examination. Tutorial literature survey of a subfield of Physiology and of pertinent areas of the candidate's minor field. This course satisfies the requirement for Part II of the Cumulative General Examination in Physiology. (Fall and spring)

398 Development of Dissertation Problem (2)

Staff

Limited to students preparing for the Doctor of Philosophy general examination. Preparation for written and oral presentation of dissertation problem. This course satisfies the requirement for Part III of the Cumulative General Examination in Physiology. (Fall and spring)

399 Dissertation Research (arr.)

Staff

Limited to Doctor of Philosophy candidates, May be repeated for credit. (Fall and spring)

Psychiatry

Professors Leon Yochelson (*Chairman*), J.E. Rankin

Clinical Professors D.C. Cameron, T.D. Noble, Sidney Berman, Morris Kleinerman, M. deG. Ruffin, Norman Taub, Samuel Yochelson (*Criminal Behavior*), D.L. Bazelon (*Socio-legal Aspects*), Leon Ferber, P.H. Gray, Paul Chodoff, H.A. Meyersburg, F.N. Waldrop, Stanley Yolles, Harold Weiner (*Experimental Psychology*), G.C. Salmoiraghi (*Neurophysiology and Neuropharmacology*), Harvey Resnick, S.N. Kieffer

Professorial Lecturers W.E. Barton, H.D. Lederer

Associate Professors Angelo D'Agostino, H.M. Grigorian

Associate Clinical Professors H.P. Laughlin, M.L. Adland, Anna Todd, I.H. Kaiser, C.T. Bever, David Eden, Margaret Mercer (*Clinical Psychology*), S.I. Szara (*Psychopharmacology*), Hans Weil-Malherbe (*Neurochemistry*), J.G. Rubin, E.S. Fleming, R.M. Greenberg, W.D. Kehne, A.M. Drummond, J.L. Sheridan, E.I. Kushner, J.H. Yacoubian, Jack Durell, John Kafka, H.B. Lehrman, J.T. English, I.H. Marill, Bertram Brown, T.D. Reynolds (*Experimental*), P.S. Weisberg, Calvin Frederick (*Medical Psychology*), L.D. Robinson, A.S. Abraham, Joseph Baker

Assistant Professor R.M. Coleman

Assistant Clinical Professors Sarah Tenenblatt, J.B. Chassan (*Biostatistics*), R.A. Rogers, J.A. Farrell, N.C. Rintz, F.G. Hilker, I.D. Milowe, W.C. Johnson, R.A. Frank, Leslie Schaffer, A.H. Kiracofe, Jr., T.M. Mackenzie, R.N. Butler, J.H. Menetrez, Christine Kehne, M.A. Woodbury, W.H. Young, Jr., J.H. Bouma, B.L. Burris, W.J. Stockton, Spencer Gordon, Jr., Marjorie

Creelman (*Psychophysiology*), C.C.H. Cullander, D.A. Lanham, J.T. Quattlebaum, W.L. Taylor (*Experimental Psychology*), D.L. Tippet, Archibald Ward, Jr. (*Sociology*), W.G. Tompkins, Frances Thomas (*Social Work*), D.S. Sprague, Roger Peele, S.L. Auster, Gertrude Cotts, Brian Crowley, Margaret Garrett, H.A. Greenberg, H.A. Hoffman, R.A. McElroy, B.P. McKaig, J.M. Post, William Davidson, J.A. Schoettler, Stephen Weissman, Pearl Holly, J.L. Evans, D.D. Cowell, Larry Dizmang, Barton Pakull, C.R. Gray, M.J. Chalick, Geraldine Schaeffer, R.T. Lewit, A.M. Messor, W.F. Weber, R.W. Wadson, Jr., M.T. Advani, M.R. Haas, Edward Black, J.H.L. Marshall, J.M. Nieder, D.E. Raskin, D.H. Fram, Robert DuPont, Jr.

Instructor J.L. Mabon (*Social Work*)

Clinical Instructors W.H. Dobbs, W.A. Hamman, G.D. Legler, D.G. Lipman, S.A. Savitz, J.W. Voell, W.J. Polk, R.A. Blum

Special Lecturer Julius Hoffman

***301 Psychiatry in the Practice of Medicine (4)** L. Yochelson and Staff

Normal personality development, psychopathology, psychosomatic disturbances, medical interviewing. Descriptions and clinical demonstration of psychoses, psychoneuroses, and character disorders with presentation of their causes, courses, and treatment. (Spring)

***302 Clinical Clerkship (5)** Rankin and Staff

Supervised examination, diagnosis, treatment of outpatients and inpatients at University and St. Elizabeths hospitals; case conferences, seminars on psychiatric referral, "psychiatric" drugs, community resources. Psychiatry in general practice stressed. (Fall and spring)

351 The Role and Professional Identity of the Physician (1) Grigorian, D'Agostino

The class explores the personal and social factors of the role of the physician—the aspect of care, identity—through discussion conducted along group dynamic lines. 12 sophomores. (Fall and spring)

382 Clinical Psychiatry (5) Waldrop

Clinical care of patients hospitalized for emotional and mental disturbances. 2 seniors; 4-week elective periods. St. Elizabeths Hosp. (December–May)

383 Psychiatric Day Care (10) Advani

Participation in the evaluation of patients referred for day care and in the various activities and programs in the day care center. Research pertaining to the day care center in its role in the treatment of psychiatric patients. 2 seniors; 8-week elective periods. Psychiatric Inst. of Wash. (December–May)

384 Geriatric Psychiatry (5) Waldrop

Care and rehabilitative efforts with elderly inpatients with psychiatric and other incapacities. 1 senior; 4-week elective periods. St. Elizabeths Hosp. (December–May)

* Required for medical students.

- 385 Schizophrenic Reactions (5)** Bullard*
Psychotherapy and ward management of schizophrenic patients. 2 seniors; 4-week elective periods. Chestnut Lodge, Rockville, Md. (December-May)
- 386 Psychiatric Research (5)** Waldrop
Research programs involving clinical and experimental investigations of human behavior. 2 seniors; 4-week elective periods. St. Elizabeths Hosp. (December-May)
- 387 Clinical Psychiatry (5)** Rankin
Care of inpatients and outpatients; diagnostic evaluations; individual and group psychotherapies, somatic therapies. 1 senior; 4-week elective periods. Univ. Hosp. (December-May)
- 388 Research: Chronic Patient (10)** Meyersburg
Research into social, anthropological, psychological factors influencing long-term care of patients with chronic diseases. 2 seniors; 8-week elective periods. Univ. Hosp. (December-May)
- 389 Day Hospitalization (5-30)** Crowley
Participation in the diagnostic and treatment programs of a separate and independent day hospital designed to prevent and replace full-time psychiatric hospitalization. Research in the area of partial hospitalization. 1 senior; 5 semester hours of credit for each 4-week elective period—students may receive up to 30 semester hours of credit for 6 months full-time. Potomac Foundation for Mental Health (December-May)
- 390 Research: Psychiatric Aspects of Criminal Behavior (5)** S. Yochelson
Social, anthropological, psychological factors producing criminal behavior. 2 seniors; 4-week elective periods. St. Elizabeths Hosp. (December-May)
- 391 Research: Constitutional Psychiatry (10)** S. Yochelson
Somatotypy, genetics, encephalography, sensory deprivation; emphasis on the criminal. 2 seniors; 8-week elective periods. St. Elizabeths Hosp. (December-May)
- 392 Administrative Psychiatry (5)** Waldrop
Apprenticeship to administrator of large public mental hospital. 1 senior; 4-week elective periods. St. Elizabeths Hosp. (December-May)

Radiology

Professor W.W. Stanbro (Chairman)

Professorial Lecturer J.M. LoPresti (Pediatrics)

Associate Professors C.F. Murphy, W.J. Nelson

Associate Clinical Professors H.J. Kicherer, John Maier, R.M. Caulk, A.C.

Wyman, D.B. Sodee (Nuclear Medicine), H.M. Hagen

Assistant Professors Richard Granke, Whei-Rung Fu, D.I. Robbins, V.K. Saini,

G.J. Augustin, Massoud Majd-Ardekani, S.J. Kurzbard

* Dr. Bullard is Senior Consultant at Chestnut Lodge, Md.

Assistant Clinical Professors Charlotte Donlan, S.R. Bersack, H.L. Berman, Bela Gondos, J.B. Johnston, Jr. (*Radiobiology*), Marion Faris, Zeki Erim, G.A. Solack, A.S. Cigtay
Clinical Instructors George Tievsky, U.V. Wilcox II, C.M. Weber, M.A. Thomas, James Burwell, R.D. Cornell

***301 Radiology (1)**

Staff

X-ray production, methods of examination, normal and pathological X-ray findings of the various body systems, special studies, introduction to radiation therapy and radioisotopes. (Spring)

380 Radiology (5)

Murphy

Each student works with all department physicians sequentially. Daily film conferences. Each student discusses one diagnostic subject in depth, using films from the teaching file. All attend scheduled department conferences. Each student will spend 4 days in Radiation Therapy as an acting intern. 7 seniors; 4-week elective periods. Univ. Hosp. (December-May)

381 Diagnostic and Therapeutic Radiology (5)

Schumacher†

Observation in fluoroscopic procedures and participation in film reading sessions; observation of techniques and rationale of radiation therapy. 2 seniors; 4-week elective periods. Wash. Hosp. Center (December-May)

382 General Radiology (5)

Kabakeris‡

Participation with the radiologist in diagnosis and therapy. Study in depth of approved subject. Room and board furnished. 1 senior; 4-week elective periods. V.A. Center, Martinsburg, W.Va. (December-May)

Surgery

Professors Brian Blades, C.T. Klopp (*Cancer*), G.S. Letterman (*Plastic*), P.C. Adkins (*Chairman*), J.G. Randolph (*Pediatrics*)
Clinical Professors W.S. McCune, V.M. Iovine, Alec Horwitz, G.A. Higgins, Jr., E.A. Gould
Associate Professors H.C. Pierpont, T.C. Alford, Don Wenger, J.E. McClenathan, P.E. Shorb, Jr., N.T. Tsangaris, J.A. Dowling, Lawrence Brettschneider, J.R. Lilly
Associate Clinical Professors J.R. Thistlethwaite, D.C. Wherry, Maxine Schurter, S.G. Mead (*Oral*), C.W. Hughes, J.H. Baugh, N.P.D. Smyth, Leon Gerber, D.H. Glew, Jr.
Assistant Professors Allan Hall, R.P. Altman
Assistant Clinical Professors L.B. Burk, Jr., William Ferguson, J.M. Keshishian, J.J. Weinstein, Isabella Harrison, J.T. Estes, Ernst Bremer, F.B. Brandt, J.W. Canter, J.B. Harrell, N.H. Isaacson, L.R. Perna, S.M. Kirson, Fernando Sacasa (*Oral*), T.M. Wright, Yeong-Cheol Koh, R.D. Shapiro (*Oral*), D.L. Morton, F.A. Camp, L.T. Bowles

* Required for medical students.

† Dr. Schumacher is with the Washington Hospital Center.

‡ Dr. Kabakeris is Radiologist at the V.A. Center, Martinsburg, West Virginia.

Instructors F.B. Liebler, W.P. Tunell, Kathryn Anderson
Clinical Instructors J.F. Conlon (*Oral*), B.G. Brown, J.H. Sager, Gerard Inguagiato, J.E. Peterson, Charles Rickerich, J.R. McClelland, G.E. White, Sheldon Holen (*Periodontics*), C.A. Silva, E.R. Lamm, K.S. Latchis, W.D. Moyle, Jr.

Special Lecturer D.F. Lynch (*Oral*)

***301 Lectures in Surgery (2)**

Staff

***303 Clinical Clerkship I (10)**

Eight weeks at University Hospital.

Staff

***304 Clinical Clerkship II (5)**

Four-week extension of Clinical Clerkship I.

Staff

***305 Emergency Room and Anesthesia (5)**

Four-week clerkship with experience in University Hospital and Clinic. Seniors.

Staff

380 Advanced General Surgery Clerkship (5)

Shorb, Tsangaris

Participation in the preoperative and postoperative care of patients. 2 seniors; 4-week elective periods. Univ. Hosp. (December-May)

Hughes

381 General Surgery (5)

(Formerly Surg 390 General Surgery IV)

Participation in total patient care—operative procedures on three separate surgical sections and on a peripheral vascular section. Daily ward rounds, weekly grand rounds, conferences, and seminars. Both clinical and basic sciences are available. 6 seniors; 4-week elective periods. Walter Reed Gen. Hosp. (December-May)

Higgins

382 General Surgery (5)

(Formerly Surg 391 General Surgery V)

Participation in total care program of surgical patients. Daily rounds, conferences, and seminars. 4 seniors; 4-week elective periods. V.A. Hosp. (December-May)

Thistlethwaite

383 General Surgery (5)

(Formerly Surg 387 General Surgery III)

Surgery rounds, diagnostic studies, operational experience, preoperative and postoperative care, and seminars. 2 seniors; 4-week elective periods. D.C. Gen. Hosp. (December-May)

Adkins

384 Thoracic-Cardiovascular Surgery (5)

Basic principles of research in thoracic, cardiac, or peripheral vascular surgery; assigned reading; experience in clinical and experimental studies. 2 seniors; 4-week elective periods. (December-May)

Klopp

385 Head and Neck Surgery (5)

(Formerly Surg 382)

Study of new patients and follow-up of treated cases, minor surgical procedures, observation of operating room procedures, and assigned reading. 1 senior; 4-week elective periods. (December-May)

* Required for medical students.

386 Pediatric Surgery (5)*(Formerly Surg 394)*

Randolph

Participation in an active, closely-supervised surgical service for infants and children; includes congenital defects, cardiac surgery, trauma, and neoplasms. Diagnostic studies, preoperative and postoperative care, and operating room procedures. 3 seniors; 4-week elective periods. Children's Hosp. (December-May)

387 Plastic Surgery (5)*(Formerly Surg 389)*

Letterman

Basic aspects of plastic and reconstructive surgery. 2 seniors; 4-week elective periods. (December-May)

388 Extramural Surgical Electives (arr.)

The Department arranges for selected students to spend a specified period of time at other institutions.

389 Surgical Preceptorship (5)

Iovine, McCune, Thistlethwaite

Participation in general care of surgical patients in an office setting. 3 seniors; 4-week elective periods. (December-May)

399 Disaster Medicine (1)

Pierpont

Lectures and demonstrations showing management of mass casualties resulting from natural and unusual causes, including the effects of biologic warfare and nuclear explosions. Sophomores. (Fall)

Urology

Professors L.R. Culbertson, F.C. Derrick, Jr. (*Chairman*)
Clinical Professors E.E. Ferguson, W.D. Jarman

Associate Clinical Professor F.T. Reuter

Assistant Clinical Professors Gilbert Ottenberg, G.R. MacDonald, H.A. Goldberg, W.D. Oldham, R.C. Rhame

Clinical Instructors H.D. Wolff, Jr., John Kenealy, George Dudas, H.J. Klapproth, R.E. Ware, W.L. Banfield, I.S. Young, Chalon Rodriguez, E.H. Soifer, Hernando Salcedo

380 Clinical Urology I (5)

Reuter

Instruction in outpatient and diagnostic urology, including cystoscopy and radiographic procedures. 1 senior; 4-week elective periods. Univ. Hosp. (December-May)

381 Clinical Urology II (5)

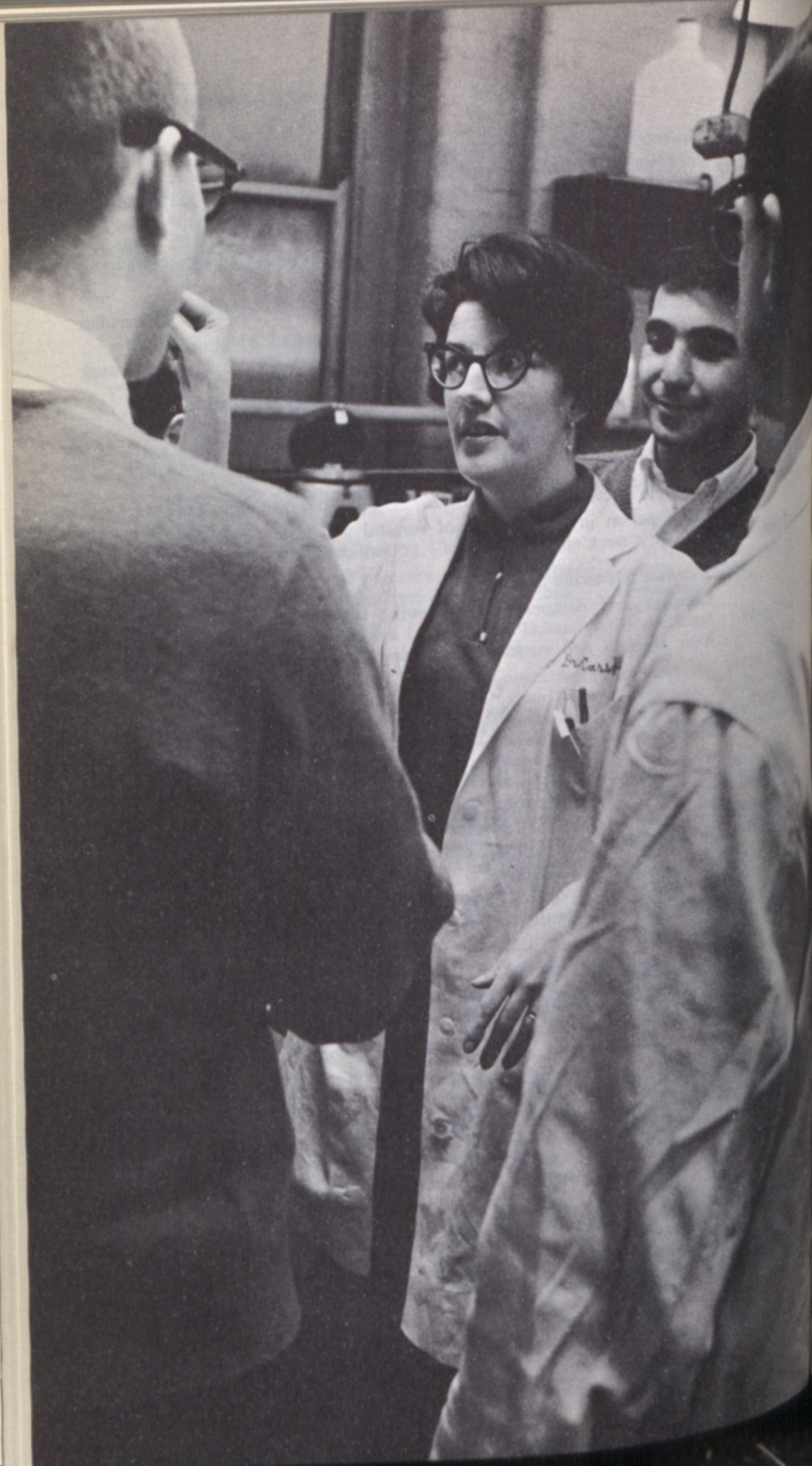
Culbertson

Observation of urologic conditions and procedures for diagnosis and treatment, radiologic and pathologic studies, endoscopy and surgery, collateral reading, weekly staff conference. 2 seniors; 4-week elective periods. Univ. Hosp. (December-May)

382 Clinical Urology III (5)

Culbertson

Observation of urologic conditions and procedures for diagnosis and treatment, radiologic and pathologic studies, endoscopy and surgery, collateral reading, weekly staff conference. 2 seniors; 4-week elective periods. V.A. Hosp. (December-May)



THE UNIVERSITY

HISTORY AND ORGANIZATION

THE GEORGE WASHINGTON UNIVERSITY had its beginning in 1821 as The Columbian College in the District of Columbia. The name of the institution was changed in 1873 to Columbian University and in 1904 to The George Washington University. The debt of the University to George Washington, whose name it bears, is an intangible one.

George Washington, as President and as private citizen, had urgently insisted upon the establishment of a National University in the Federal City. There he hoped that, while being instructed in the arts and sciences, students from all parts of the country would acquire the habits of good citizenship, throwing off local prejudices and gaining at first hand a knowledge of the practice, as well as the theory, of republican government. To further the materialization of his hopes, Washington left a bequest of fifty shares of The Potomac Company "towards the endowment of a University to be established within the limits of the District of Columbia, under the auspices of the General Government, if that government should incline to extend a fostering hand towards it." The Congress never extended "a fostering hand." The Potomac Company passed out of existence, and Washington's bequest became worthless.

Fully conscious of Washington's hopes, but motivated primarily by a great missionary urge and the need for a learned clergy, a group of dedicated ministers and laymen sponsored a movement for the establishment of a college in the District of Columbia. Inspired largely by the zeal and energy of the Reverend Luther Rice, they raised funds for the purchase of a site and petitioned Congress for a charter. After much delay and amendment, Congress granted a charter which was approved by President Monroe on February 9, 1821. To safeguard the College's nonsectarian character it provided "That persons of every religious denomination shall be capable of being elected Trustees; nor shall any person, either as President, Professor, Tutor or pupil, be refused admittance into said College, or denied any of the privileges, immunities, or advantages thereof, for or on account of his sentiments in matters of religion."

During the entire time when the institution was known as Columbian College, its activities were centered on College Hill, a tract of forty-six and a half acres between the present Fourteenth and Fifteenth Streets extending north from Florida Avenue somewhat beyond Columbia Road. The Medical School was located downtown. For the better part of the Columbian University period,

the buildings of the University were situated along H Street between Thirteenth and Fifteenth Streets. The Medical School group still remains there.

During the last half century the University's present plant has been developed in that section of the old First Ward familiarly known as "Foggy Bottom," between Nineteenth and Twenty-fourth Streets, south of Pennsylvania Avenue. Within a few squares are the White House, the Department of the Interior, the State Department, the World Bank, and many other governmental offices and international agencies. The area is not without its reminders of historic interest to the University. President Monroe, who signed the Charter, lived at 2017 Eye Street. The first President of the Board of Trustees, the Reverend Obadiah B. Brown, was for fifty years the pastor of a church at Nineteenth and Eye Streets, and Washington selected Twenty-third and E Streets as the site of the National University he had hoped to see established.

The University as it is now organized consists of Columbian College of Arts and Sciences (undergraduate); the Graduate School of Arts and Sciences; the professional schools, which include the National Law Center and the schools of Medicine, Engineering and Applied Science, Education, Government and Business Administration, and Public and International Affairs; the College of General Studies; the Division of University Students; and the Summer Sessions.

The George Washington University is privately endowed and is governed by a self-perpetuating Board of Trustees of which the president is an *ex officio* member.

ACADEMIC STATUS

The George Washington University is accredited by its regional accrediting agency, the Middle States Association of Colleges and Secondary Schools. The University is on the approved list of the American Association of University Women and is a member of the College Entrance Examination Board. The Department of Chemistry is on the approved list of the American Chemical Society.

The School of Medicine has had continuous approval by the Council on Medical Education of the American Medical Association and the Association of American Medical Colleges. The degree of the School of Medicine is recognized by all State Examining Boards.

THE BOARD OF TRUSTEES 1970-71

Edward Karrick Morris, LL.D., *Chairman*
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 John W. Thompson, Jr., B.A., *Assistant Secretary*

Robert Calhoun Baker, LL.D.
 *Everett Hollis Bellows, B.A., M.A.
 *Harold Keith Bradford, B.A., LL.B.
 George A. Butler, LL.B.
 Mortimer Maxwell Caplin, B.S., LL.B., J.S.D., LL.D.
 Leonard Carmichael, Ph.D., Sc.D., LL.D., Litt.D., L.H.D., D.C.L.
 Eugene Cassin Carusi, M.A., J.D.

* Nominated by the Alumni.

- Henry Christian Clausen, J.D.
 Miss Jacqueline Cochran, L.H.D., LL.D., Sc.D.
 Donald C. Cook, B.A., M.B.A., J.D., LL.M., L.H.D., LL.D.
 *Harry Filmore Dowling, B.A., M.D., Sc.D.
 Harry F. Duncan
 John Bonner Duncan, B.A., LL.B., LL.D.
 Lloyd Hartman Elliott, M.A., Ed.D., LL.D., *President of the University, ex officio*
 Mrs. Katharine Graham, B.A.
 Melville Bell Grosvenor, B.S., Sc.D., LL.D.
 Richard A. Harrison, B.A., M.A.
 Brooks Hays, B.A., J.D., LL.D., L.H.D., D.C.L., D.D., HH.D.
 Joseph H. Hirshhorn
 Joseph D. Hughes, B.S., J.D., LL.M., LL.D.
 Lewellyn A. Jennings
 David Matthew Kennedy, LL.B., B.A., LL.D.
 *Thaddeus A. Lindner, B.A. in Govt.
 Franklin Jerome Lunding, LL.B., LL.D.
 Jeremiah Milbank, Jr., B.A., M.B.A.
 Godfrey Leon Munter, B.A., LL.B., LL.D.
 *Beverly Ann Henry Oliphant, B.S., M.S., M.D.
 Thornton W. Owen, B.S. in C.E., B.A.
 Sidney Dillon Ripley II, Ph.D., L.H.D., Sc.D.
 Orville Findley Rush, J.D., LL.D.
 Carleton D. Smith
 Charles E. Smith
 Douglas Rathbone Smith, B.S.C.
 Mark Sullivan, Jr., B.A.
 *William Gregg White, B.S. in C.E.
 John Johnston Wilson, LL.B.
 Watson W. Wise, Ph.B.
 Stephen Russell Woodzell, B.S. in E.E.
 James Otis Wright, B.S., J.D.

HONORARY TRUSTEES

- Walter Maximillian Bastian, LL.B., LL.D.
 Newell Windom Ellison, B.A., LL.B., LL.D.
 Charles Carroll Glover, Jr., M.A., LL.B., LL.D.
 John Edgar Hoover, LL.M., LL.D., Sc.D., D.C.L.
 Alfred Henry Lawson, LL.B., LL.D.
 John Keown McKee
 Benjamin Mosby McKelway, Litt.D.
 Sidney William Souers, B.A., LL.D.
 Lewis L. Strauss, Sc.D., LL.D., L.H.D.
 Alexander Wetmore, Ph.D., Sc.D.
 Lloyd Bennett Wilson

*Nominated by the Alumni.

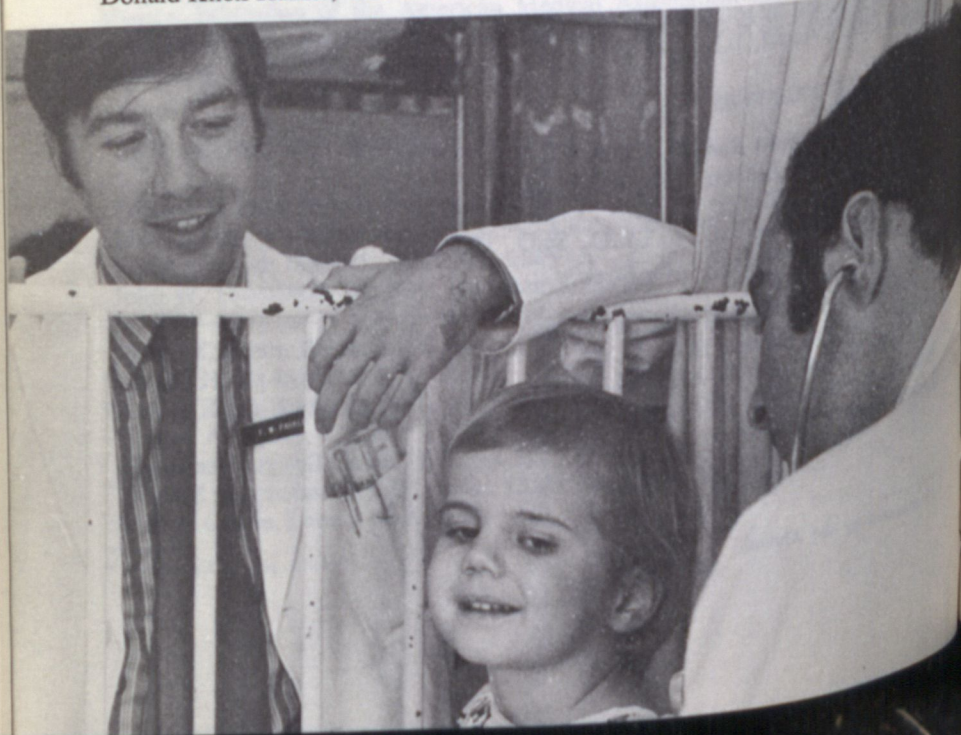
OFFICERS OF ADMINISTRATION 1969-70

THE UNIVERSITY

Lloyd Hartman Elliott, M.A., Ed.D., LL.D., *President*
 Harold Frederick Bright, Ph.D., *Provost and Vice President for Academic Affairs*
 Henry William Herzog, B.S., *Vice President and Treasurer*
 Seymour Alpert, B.A., M.D., *Vice President for Development*
 H. John Cantini, Jr., LL.B., *Vice President for Administration*
 William David Johnson, B.S., *Director of the Budget*
 Louis Harkey Mayo, B.S., J.S.D., *Vice President for Policy Studies and Special Projects*
 William Parkhurst Smith, Jr., B.A., M.B.A., *Vice President for Student Affairs*
 Frederick Russell Houser, M.A., *Registrar*
 Joseph Young Ruth, B.A., *Director of Admissions*

THE SCHOOL OF MEDICINE AND THE UNIVERSITY HOSPITAL AND CLINIC

John Parks, M.S., M.D., *Dean of the Medical Center*
 James Joseph Feffer, B.A., M.D., *Associate Dean of the Medical Center, for Clinical Affairs*
 Clarence Alfred Lowe, B.A., Ed.M., *Associate Dean of the Medical Center, for Research*
 Frank Nelson Miller, Jr., B.S., M.D., *Associate Dean of the Medical Center, for Student and Curricular Affairs*
 Ronald Paul Kaufman, B.S., M.D., *Medical Director of the University Hospital*
 Calvin Trexler Klopp, B.A., M.D., *Medical Director of the University Clinic*
 Victor Frederick Ludewig, B.S., *Administrator of the University Hospital and Clinic*
 Donald Knox Hames, B.S. in B.A., *Budget Officer*



THE SCHOOL OF MEDICINE

Faculty and Staff of Instruction*

EMERITI

- Errett Cyril Albritton, *Professor Emeritus of Physiology*
B.A. 1916, University of Missouri; M.D. 1921, Johns Hopkins University
- Harry Ford Anderson, *Professor Emeritus of Dermatology and Syphilology*
M.D. 1924, University of Cincinnati
- Walter Andrew Bloedorn, *Professor Emeritus of Medicine*
M.D. 1909, Creighton University; B.A. 1915, M.A. 1916, Sc.D. 1948, George Washington University
- Dexter Means Bullard, *Professor Emeritus of Clinical Psychiatry*
Ph.B. 1920, Yale University; M.D. 1923, University of Pennsylvania
- Henry Laurant Darner, *Professor Emeritus of Clinical Obstetrics and Gynecology*
B.A. 1916, Western Maryland College; M.D. 1920, Johns Hopkins University
- Paul Frederick Dickens, *Professor Emeritus of Clinical Medicine*
M.D. 1908, University of Nashville
- Clayton Bernard Ethridge, *Professor Emeritus of Medicine*
M.D. 1933, University of Virginia
- Hayden Kirby-Smith, *Professor Emeritus of Clinical Dermatology*
B.S. 1927, University of the South; M.D. 1937, George Washington University
- Chester Elwood Leese, *Professor Emeritus of Physiology*
B.A. 1922, M.A. 1925, Ph.D. 1930, University of Iowa
- Edward Lewis, *Professor Emeritus of Clinical Pediatrics*
M.D. 1918, George Washington University
- Preston Alexander McLendon, *Professor Emeritus of Pediatrics*
B.S. 1913, Wake Forest University; M.D. 1915, Columbia University
- Daniel Bruce Moffett, *Professor Emeritus of Otolaryngology*
B.A. 1910, University of Richmond; M.D. 1915, University of Maryland
- Margaret Mary Nicholson, *Professor Emeritus of Clinical Pediatrics*
B.A. 1922, M.D. 1925, George Washington University
- George Nordlinger, *Professor Emeritus of Clinical Obstetrics and Gynecology*
B.A. 1918, M.D. 1922, George Washington University
- Leland Wilbur Parr, *Professor Emeritus of Bacteriology*
B.S. 1916, Ph.D. 1923, University of Chicago

* The Faculty and Staff of Instruction listed here and at the head of each department is for the academic year 1970-71.

Herbert Pollack, *Professor Emeritus of Clinical Medicine (Biochemistry)*
B.A. 1925, Washington and Lee University; M.D. 1929, Cornell University; Ph.D. 1933, University of Minnesota

Frederick A. Reuter, *Professor Emeritus of Urology*
M.D. 1916, George Washington University

Ernest Alfred Watson Sheppard, *Professor Emeritus of Clinical Ophthalmology*
M.D., C.M. 1926, Queens University, Canada

Thomas Carlton Thompson, *Professor Emeritus of Clinical Urology*
B.S. in Med., M.D. 1920, George Washington University

Janet Graeme Travell, *Professor Emeritus of Clinical Medicine*
B.A. 1922, Wellesley College; M.D. 1926, Cornell University

James Winston Watts, *Professor Emeritus of Neurological Surgery*
B.S. 1924, Virginia Military Institute; M.D. 1928, University of Virginia

ACTIVE

Theodore Judson Abernethy, *Associate Clinical Professor of Medicine*
B.S. 1925, Denison University; M.D. 1929, Johns Hopkins University

Abe Samuel Abraham, *Associate Clinical Professor of Psychiatry*
B.S. 1938, Westminster College, Pennsylvania; M.D. 1950, George Washington University

Kristof Abraham, *Clinical Instructor in Neurology*
M.D. 1952, Budapest University, Hungary

Sidney Abraham, *Instructor in Clinical Engineering*
B.S. 1936, City College, New York

Herbert Abramson, *Associate Clinical Professor of Medicine*
B.A. 1924, M.A. 1925, M.D. 1935, George Washington University

John Pletch Adams, *Professor of Orthopaedic Surgery*
B.S. 1943, University of Missouri; M.D. 1945, Washington University

Edward Adelson, *Associate Clinical Professor of Medicine*
B.S. 1943, M.D. 1947, Tufts University

Paul Charles Adkins, *Professor of Surgery*
B.A. 1944, M.D. 1948, Johns Hopkins University

Marvin Leon Adland, *Associate Clinical Professor of Psychiatry*
B.S. 1941, M.D. 1943, University of Chicago

Mohan Teckchand Advani, *Assistant Clinical Professor of Psychiatry*
B.S. 1955, Punjab University, India; M.B., B.S. 1960, Osmani University, India; D.P.M. 1964, Mysore University, India

Lewis Francis Affronti, *Associate Professor of Microbiology*
B.A. 1950, M.A. 1951, State University of New York at Buffalo; Ph.D. 1958, Duke University

Cosimo Ajmone Marsan, *Assistant Clinical Professor of Neurology*
M.D. 1942, University of Torino, Italy

Robert Wayne Albers, *Professorial Lecturer in Biochemistry (Brain)*
B.S. 1950, University of Nebraska; Ph.D. 1954, Washington University

Chalom Albert, *Assistant Clinical Professor of Anesthesiology*
B.A. 1949, M.D. 1953, American University of Beirut, Lebanon

Ernest Narinder Albert, *Assistant Professor of Anatomy*
B.S. 1959, High Point College; M.S. 1963, University of Pittsburgh; Ph.D. 1965, Georgetown University

Solomon Naphtali Albert, *Assistant Clinical Professor of Anesthesiology*
B.A. 1936, M.D. 1940, American University of Beirut, Lebanon

Jousef Al-Doory, *Assistant Professor of Epidemiology and Environmental Health*
B.S. 1945, University of Baghdad, Iraq; M.A. 1951, University of Texas at Austin; Ph.D. 1954, Louisiana State University

- Theodore Crandall Alford, *Associate Professor of Surgery*
B.A. 1944, Haverford College; M.D. 1947, Johns Hopkins University
- Frank Duane Allan, *Professor of Anatomy*
B.S. 1947, M.S. 1949, University of Utah; Ph.D. 1954, Louisiana State University
- James Curwood Aller, *Associate Professor of Clinical Engineering*
B.S. 1942, U.S. Naval Academy; M.A. 1949, M.E.S. 1954, Harvard University; D.Sc. 1968, George Washington University
- Melvin Gustavus Alper, *Clinical Professor of Ophthalmology*
B.A. 1943, M.D. 1945, University of Virginia
- Hubert Joseph Alpert, *Clinical Instructor in Medicine*
M.D. 1962, University of Illinois
- Louis Katz Alpert, *Professor of Medicine*
B.S. 1928, M.D. 1932, Yale University
- Seymour Alpert, *Professor of Anesthesiology; Vice President of the University, for Development*
B.A. 1939, Columbia University; M.D. 1943, State University of New York, Downstate Medical Center
- Roy Peter Altman, *Assistant Professor of Surgery*
B.A. 1955, Colgate University; M.S. 1958, University of Rochester; M.D. 1961, New York Medical College
- James Francis Ambury, *Assistant Clinical Professor of Medicine*
B.S. 1937, Fordham University; M.D. 1941, Georgetown University
- Harvey Hirsch Ammerman, *Clinical Professor of Neurological Surgery*
B.S. 1939, M.D. 1943, George Washington University
- Arthur James Anderson, *Clinical Instructor in Medicine*
M.D. 1961, George Washington University
- James Edward Anderson, *Clinical Instructor in Obstetrics and Gynecology*
B.A. 1955, Union College, Nebraska; M.D. 1965, Loma Linda University
- Kathryn Dorothy Duncan Anderson, *Instructor in Surgery*
B.A. 1961, M.A. 1964, Cambridge University, England; M.D. 1964, Harvard University
- Robert Harper Anderson, *Clinical Instructor in Pediatrics*
M.D. 1946, Duke University
- W. French Anderson, *Professorial Lecturer in Biochemistry (Genetics)*
B.A. 1958, M.D. 1963, Harvard University; M.A. 1960, Cambridge University, England
- William Staton Anderson, *Clinical Professor of Pediatrics*
B.A. 1927, Duke University; M.D. 1931, Johns Hopkins University
- John Lawrence Angel, *Professorial Lecturer in Anatomy and Anthropology*
B.A. 1936, Ph.D. 1942, Harvard University
- Albert Anthony Apicelli, *Clinical Instructor in Obstetrics and Gynecology*
B.A. 1961, Fordham University; M.D. 1965, Albany Medical College
- Leonard Philip Appel, *Clinical Instructor in Medicine*
B.A. 1953, M.D. 1957, New York University
- Ronald Alan Apter, *Assistant Clinical Professor of Medicine*
M.D. 1958, George Washington University
- Minoru Araki, *Research Instructor in Ophthalmology*
M.D. 1957, M.S.D. 1962, Tokyo Medical and Dental University, Japan
- Irwin Ardham, *Assistant Clinical Professor of Medicine*
B.A. 1948, New York University; M.D. 1954, New York Medical College
- Luis Felipe Arias-Bernal, *Instructor in Obstetrics and Gynecology*
B.A. 1950, National College of Saint Bartholomew, Colombia; M.D. 1957, National University, Colombia
- Mansour Farid Armaly, *Professor of Ophthalmology*
B.A. 1947, M.D. 1952, American University of Beirut, Lebanon; M.S. 1957, University of Iowa

- Malcolm Stewart Artenstein, *Assistant Clinical Professor of Medicine*
B.A. 1951, Brown University; M.D. 1955, Tufts University
- Gilbert Paul August, *Assistant Professor of Pediatrics*
B.S. 1958, City College, New York; M.D. 1962, New York University
- Gunter Josef Augustin, *Assistant Professor of Radiology*
M.D. 1952, University of Heidelberg, Germany
- Jorge Ignacio Auñón, *Research Instructor in Anesthesiology*
B.S. in Engr. 1967, M.S. 1969, George Washington University
- Simon Leo Auster, *Assistant Clinical Professor of Psychiatry*
B.A. 1952, Yeshiva University; M.D. 1956, New York University
- Gordon Avery, *Associate Professor of Pediatrics*
B.A. 1953, Harvard University; M.D. 1958, Ph.D. 1959, University of Pennsylvania
- William Ross Ayers, *Associate Professor of Clinical Engineering*
B.S. 1957, M.D. 1961, Georgetown University
- Eduardo Azcarate, *Instructor in Pediatrics (Psychology)*
B.A. 1965, M.A. 1967, Ph.D. 1970, Catholic University of America
- Silas Babin, Jr., *Assistant Clinical Professor of Medicine*
M.D. 1951, Louisiana State University
- Frank Solomon Bacon, *Associate Clinical Professor of Medicine*
B.S. 1928, M.B. 1930, M.D. 1931, University of Minnesota
- James Michael Bacos, *Associate Professor of Medicine*
B.S. 1948, Virginia Polytechnic Institute; M.D. 1953, Duke University
- Robert Emil Badwey, *Clinical Instructor in Obstetrics and Gynecology*
B.S. 1955, Franklin and Marshall College; M.D. 1959, University of Pittsburgh
- Alfred Baer, *Associate Clinical Professor of Medicine*
B.A. 1942, Ohio State University; M.D. 1945, Johns Hopkins University
- William Eldridge Bageant, *Assistant Clinical Professor of Anesthesiology*
M.D. 1939, George Washington University
- Jack Sidney Bailey, *Assistant Research Professor of Medicine (Microbiology)*
B.S. 1952, Hampton Institute; M.S. 1960, Howard University
- *John Martyn Bailey, *Professor of Biochemistry*
B.S. 1949, Ph.D. 1952, University of Wales
- William Otis Bailey, Jr., *Associate Clinical Professor of Medicine*
M.D. 1940, George Washington University
- George Ivan Baker, *Assistant Clinical Professor of Orthopaedic Surgery*
B.A. 1950, Syracuse University; M.D. 1954, State University of New York, Upstate Medical Center
- Joseph Baker, *Associate Clinical Professor of Psychiatry*
B.A. 1940, Sc.D. 1970, Gettysburg College; M.D. 1944, Temple University
- Guillermo Alfredo Balfour, *Special Lecturer in Pediatrics*
M.D. 1959, University of Buenos Aires, Argentina
- Giuseppe Balsamo, *Assistant Clinical Professor of Medicine*
Laurea in Medicinae Chirurgia 1952, University of Rome, Italy
- Bernard Alvin Band, *Clinical Instructor in Obstetrics and Gynecology*
B.A. 1952, B.S. 1954, George Washington University; M.D. 1959, Howard University
- William Landon Banfield, *Clinical Instructor in Urology*
B.A. 1954, Princeton University; M.D. 1958, George Washington University
- Samuel Harvard Barboo, Jr., *Assistant Professorial Lecturer in Epidemiology and Environmental Health*
B.S. 1955, M.P.H. 1957, University of California, Berkeley; Dr.P.H. 1966, University of California, Los Angeles
- Lewellys Franklin Barker, *Clinical Instructor in Medicine*
B.A. 1955, Princeton University; M.D. 1959, Johns Hopkins University

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B.A. 1951, Sarah Lawrence College; M.D. 1956, Harvard University
- Solomon Efrem Barr, *Assistant Clinical Professor of Medicine*
B.A. 1951, M.D. 1954, George Washington University
- Andre Barrabini, *Clinical Instructor in Medicine*
M.D. 1953, University of Paris, France
- John William Barrett, *Clinical Instructor in Neurological Surgery*
M.D. 1958, George Washington University
- Robert Henry Barter, *Professor of Obstetrics and Gynecology*
B.S. 1937, M.D. 1940, University of Wisconsin
- Walter Earl Barton, *Professorial Lecturer in Psychiatry*
B.S. 1928, M.D. 1931, University of Illinois
- William Howard Barton, *Assistant Professor of Pediatrics (Psychiatry)*
B.A. 1955, Yale University; M.D. 1960, University of Tennessee
- Emil Herbert Bauersfeld, *Assistant Clinical Professor of Medicine*
B.A. 1932, M.D. 1935, George Washington University
- Joseph Harold Baugh, *Associate Clinical Professor of Surgery*
B.S. 1949, Wilmington College, Ohio; M.D. 1953, St. Louis University
- David Lionel Bazelon, *Clinical Professor of Psychiatry (Socio-legal Aspects)*
B.S. in Law 1931, Northwestern University; LL.D. 1966, Colby College
- Harry Carl Beaver, *Clinical Instructor in Obstetrics and Gynecology*
B.S. 1959, Wheaton College, Illinois; M.D. 1963, George Washington University
- Arthur Abbe Becker, *Clinical Instructor in Obstetrics and Gynecology*
B.S. 1956, City College, New York; M.D. 1961, University of Iowa
- Kenneth Louis Becker, *Associate Professor of Medicine*
B.A. 1952, University of Michigan; M.D. 1956, New York Medical College; Ph.D. 1963, University of Minnesota
- Samuel Michael Belinsky, *Clinical Instructor in Obstetrics and Gynecology*
B.A. 1955, University of Bridgeport; M.D. 1959, George Washington University
- Robert Reid Belton, *Associate Clinical Professor of Medicine*
B.A. 1944, Willamette University; M.D. 1948, George Washington University
- Ruth Boschwitz Benedict, *Associate Clinical Professor of Medicine*
B.A. 1935, Wellesley College; M.D. 1939, New York University
- Roger Bergstrom, *Clinical Instructor in Pediatrics*
M.D. 1952, George Washington University
- Peter Morris Berkman, *Assistant Professor of Medicine*
B.A. 1955, Harvard University; M.D. 1959, Columbia University
- David Kip Berler, *Assistant Clinical Professor of Ophthalmology*
B.A. 1955, M.D. 1958, Cornell University
- Cheston Milton Berlin, Jr., *Assistant Professor of Pediatrics*
B.A. 1958, Haverford College; M.D. 1962, Harvard University
- Robert William Berliner, *Special Lecturer in Medicine (Renal Disease)*
B.S. 1936, Yale University; M.D. 1939, Columbia University
- Harry Louis Berman, *Assistant Clinical Professor of Radiology*
B.S. 1937, Bradley University; M.B. 1932, M.D. 1933, Northwestern University
- Sidney Berman, *Clinical Professor of Psychiatry*
B.S. 1928, M.D. 1932, Georgetown University
- Howard Nathan Bernstein, *Assistant Clinical Professor of Ophthalmology*
B.S. 1953, Bucknell University; M.D. 1957, State University of New York, Downstate Medical Center
- Leon Bernstein, *Professor of Medicine*
B.S. 1939, M.R.C.S., L.R.C.P. 1949, Ph.D. 1957, University of London, England
- Solomon Rodney Bersack, *Assistant Clinical Professor of Radiology*
B.S. 1931, City College, New York; M.D. 1935, New York University

- Martin Bertman, *Clinical Instructor in Obstetrics and Gynecology*
B.S. 1961, George Washington University; M.D. 1965, New York Medical College
- Gerrit Besselaar, *Assistant Professor of Medicine (Pharmacology)*
M.D. 1959, University of Leiden, Netherlands
- Christopher Theodore Bever, *Associate Clinical Professor of Psychiatry*
B.A. 1940, M.D. 1943, Harvard University
- Lewis Henry Biben, *Assistant Clinical Professor of Medicine*
M.D. 1949, Hahnemann Medical College
- Edward Black, *Assistant Clinical Professor of Psychiatry*
B.S. 1959, Dickinson College; M.D. 1963, New York Medical College
- Emilie Annabelle Black, *Clinical Instructor in Pediatrics*
B.S. 1942, M.D. 1945, George Washington University
- Brian Blades, *Lewis Saltz Professor of Surgery*
B.A. 1928, University of Kansas; M.D. 1932, Washington University
- Ethel Joan Blanchette-Mackie, *Associate Professorial Lecturer in Anatomy*
B.S. 1956, Queens College, New York; M.S. 1959, New York University; Ph.D. 1965, Columbia University
- Robert Allan Blum, *Clinical Instructor in Psychiatry*
B.S. 1959, M.S. 1960, Massachusetts Institute of Technology; M.D. 1964, University of Pennsylvania
- Joe Morris Blumberg, *Clinical Professor of Pathology*
B.S. 1930, M.D. 1933, Emory University
- Norman Kay Bohrer, *Clinical Instructor in Medicine*
M.D. 1957, George Washington University
- Frank Joseph Borsody, *Clinical Instructor in Medicine*
B.A. 1955, George Washington University; M.D. 1960, University of Virginia
- John Andrew Bottiglione, *Special Lecturer in Pediatrics*
B.S. 1958, University of Notre Dame; M.D. 1962, Seton Hall University
- David John Boullin, *Special Lecturer in Pharmacology*
B.S. 1956, B.S. 1958, M.S. 1960, University of London, England
- John Henry Bouma, *Assistant Clinical Professor of Psychiatry*
B.A. 1948, B.S. 1949, M.B. 1952, M.D. 1953, University of Minnesota
- Lawrence Thompson Bowles, *Assistant Clinical Professor of Surgery*
B.A. 1953, M.D. 1957, Duke University; M.S. 1957, New York University
- Roscoe Brady, Jr., *Professorial Lecturer in Biochemistry (Brain)*
M.D. 1947, Harvard University
- Carl David Brandt, *Assistant Professor of Pediatrics (Microbiology)*
B.S. 1949, University of Connecticut; M.S. 1951, University of Massachusetts; Ph.D. 1958, Harvard University
- Frederick Bertram Brandt, *Assistant Clinical Professor of Surgery*
B.S. 1942, M.D. 1943, University of Maryland
- Ernst Bremer, *Assistant Clinical Professor of Surgery*
M.D. 1949, University of Marburg, Germany
- Gloria Godbey Brennan, *Assistant Clinical Professor of Pathology*
B.A. 1949, M.D. 1952, George Washington University
- Frances Elizabeth Brennecke, *Clinical Instructor in Orthopaedic Surgery*
B.A. 1927, University of Pennsylvania; M.D. 1936, University of Chicago
- Alexander Breslow, *Associate Professor of Pathology*
B.S. 1948, M.S., M.D. 1953, University of Chicago
- Lawrence Brettschneider, *Associate Professor of Surgery*
B.S. 1957, Union College, New York; M.D. 1961, State University of New York, Upstate Medical Center
- Alice Brigham, *Assistant Clinical Professor of Medicine*
B.A. 1936, M.D. 1941, University of Michigan

- Albert Seymour Bright, *Clinical Instructor in Obstetrics and Gynecology*
B.A. 1935, M.D. 1938, George Washington University
- Warren Daniel Brill, *Associate Clinical Professor of Medicine*
B.S., M.D. 1944, University of Maryland
- Bernard Beryl Brodie, *Professorial Lecturer in Pharmacology*
B.S. 1931, McGill University, Canada; Ph.D. 1935, New York University
- Arnold Gene Brody, *Clinical Instructor in Medicine*
M.D. 1960, University of Illinois
- Bertram Brown, *Associate Clinical Professor of Psychiatry*
B.A. 1952, Brooklyn College; M.D. 1956, Cornell University; M.P.H. 1960, Harvard University
- Brooks Gideon Brown, *Clinical Instructor in Surgery*
M.D. 1939, George Washington University
- Crawford Southwell Brown, *Assistant Clinical Professor of Dermatology*
B.A. 1946, Kenyon College; M.D. 1948, University of Michigan
- Halla Brown, *Professor of Medicine*
M.D. 1939, Johns Hopkins University
- Raymond Nathan Brown, *Associate Clinical Professor of Anatomy*
M.D. 1943, George Washington University
- Thomas McPherson Brown, *Professor of Medicine*
B.A. 1929, Swarthmore College; M.D. 1933, Johns Hopkins University
- Philip Craig Brunschwyler, *Assistant Clinical Professor of Pediatrics*
B.A. 1951, West Virginia University; M.D. 1955, University of Maryland
- James Edward Bryan, *Professorial Lecturer in Medical and Public Affairs*
Ph.B. 1927, Wesleyan University
- George Cumming Buchanan, *Assistant Clinical Professor of Medicine*
B.A. 1943, Duke University; M.D. 1948, Johns Hopkins University
- Fred Hurd Burbank, *Clinical Instructor in Medicine*
B.A. 1963, M.D. 1968, Stanford University
- Lloyd Byron Burk, Jr., *Assistant Clinical Professor of Surgery*
B.A. 1938, M.D. 1942, University of Virginia
- William Wesley Burr, Jr., *Professorial Lecturer in Biochemistry (Isotopes)*
B.A. 1947, University of Nebraska; M.S. 1948, Ph.D. 1951, University of Illinois; M.D. 1960, University of Texas at Austin
- Boyd Lee Burris, *Assistant Clinical Professor of Psychiatry*
B.S. 1951, M.D. 1952, University of Tennessee
- James Burwell, *Clinical Instructor in Radiology*
B.A. 1952, University of Pittsburgh; M.D. 1956, University of Maryland
- Stewart William Bush, *Associate Clinical Professor of Medicine*
B.S. 1943, University of Massachusetts; M.D. 1946, Johns Hopkins University
- Robert Neil Butler, *Assistant Clinical Professor of Psychiatry*
B.A. 1949, M.D. 1953, Columbia University
- Cesar Augusto Caceres, *Professor of Clinical Engineering*
B.S. 1949, M.D. 1953, Georgetown University
- Allan Bartlett Cady, *Assistant Clinical Professor of Medicine*
B.S. 1958, M.D. 1960, University of Illinois
- Paul Calabrisi, *Alumni Professor of Anatomy*
B.A. 1931, Catholic University of America; M.A. 1940, George Washington University; Ph.D. (Cantab.) 1955, Cambridge University, England
- Dale Corbin Cameron, *Clinical Professor of Psychiatry*
B.A. 1933, M.D. 1936, University of Nebraska; M.P.H. 1951, Johns Hopkins University
- Frank Alphonse Camp, *Assistant Clinical Professor of Surgery*
B.A. 1954, College of the Holy Cross; M.D. 1958, Syracuse University
- Carlena Lee Campbell, *Clinical Instructor in Obstetrics and Gynecology*
B.S. 1955, West Virginia University; M.D. 1957, Virginia Commonwealth University Medical College of Virginia

- Jerome Wolf Canter, *Assistant Clinical Professor of Surgery*
M.D. 1955, George Washington University
- David Roland Carlson, *Clinical Instructor in Obstetrics and Gynecology*
B.S. 1953, Drake University; M.D. 1960, George Washington University
- Charles Patrick Henry Carroll, *Clinical Instructor in Neurological Surgery*
B.A. 1952, Boston College; M.D. 1961, Georgetown University
- Charles Thomas Caskey, *Clinical Instructor in Medicine*
M.D. 1963, Duke University
- Marie Mullaney Cassidy, *Associate Professor of Physiology*
B.S. (General) 1957, B.S. (Special) 1958, M.S. 1959, Ph.D. 1962, National University of Ireland
- Richard Bernard Castell, *Assistant Clinical Professor of Medicine; University Physician; Director, Health Services*
B.A. 1932, M.D. 1935, George Washington University
- Hereward Seagrieve Cattell, *Clinical Instructor in Orthopaedic Surgery*
B.A. 1954, Amherst College; M.D. 1958, University of Rochester
- Ralph Mearle Caulk, *Associate Clinical Professor of Radiology*
M.D. 1934, University of Kansas
- William Paxson Chalfant, Jr., *Assistant Clinical Professor of Ophthalmology*
M.D. 1934, Hahnemann Medical College
- Morris Jay Chalick, *Assistant Clinical Professor of Psychiatry*
B.A. 1958, University of Pennsylvania; M.D. 1962, Jefferson Medical College of Philadelphia
- Thomas Clark Chalmers, *Professor of Medicine*
M.D. 1943, Columbia University
- John Loomis Chamberlain III, *Assistant Clinical Professor of Pediatrics*
B.S. 1953, Amherst College; M.D. 1957, University of Virginia
- Chao Hung Chan, *Assistant Professor of Medicine*
B.B.A. 1955, M.D. 1962, University of the East, Philippines
- *PooLiang Chang, *Clinical Instructor in Medicine*
M.D. 1959, National Taiwan University
- Eugene Joseph Chap, *Clinical Instructor in Medicine*
B.S. 1957, St. Bonaventure University; M.D. 1961, Marquette University
- Dorothea Beckh Chapman, *Assistant Clinical Professor of Medicine*
M.D. 1945, Leopold-Franzens University, Austria
- Frederic Dunbar Chapman, *Assistant Clinical Professor of Medicine*
B.A. 1933, Syracuse University; M.D., C.M. 1938, McGill University, Canada
- George Allyn Chapman, *Assistant Clinical Professor of Medicine*
B.S. 1942, College of William and Mary; M.D. 1945, Virginia Commonwealth University
- John David Chase, *Professor of Medicine*
B.A. 1942, Wabash College; M.D. 1945, Case Western Reserve University
- Jacob Bernard Chassan, *Assistant Clinical Professor of Psychiatry (Biostatistics)*
B.S. 1939, City College, New York; M.A. 1949, Ph.D. 1958, George Washington University
- Tsung Cheng, *Associate Professor of Medicine*
B.S. 1947, M.D. 1950, St. John's University, China; M.S. 1956, University of Pennsylvania
- Cecilin Chisholm, *Clinical Instructor in Pediatrics*
B.S. 1963, M.D. 1967, Howard University
- Paul Chodoff, *Clinical Professor of Psychiatry*
B.A. 1934, University of Pennsylvania; M.D. 1938, Jefferson Medical College of Philadelphia
- John Bert Christensen, *Associate Professor of Anatomy*
B.A. 1954, Brigham Young University; M.S. 1955, Ph.D. 1958, University of Oklahoma
- Yang-Ming Chu, *Assistant Professor of Microbiology*
B.S. 1959, University of Washington; M.S. 1964, Ph.D. 1967, George Washington University
- Francis Chucker, *Assistant Clinical Professor of Medicine*
M.D. 1957, Marquette University

* On leave of absence 1970-71.

- Catherine Chura, *Instructor in Medicine (Clinical Pharmacology)*
M.D. 1963, Woman's Medical College of Pennsylvania
- Lloyd Eugene Church, *Associate Professorial Lecturer in Anatomy*
B.A. 1942, West Virginia University; D.D.S. 1944, University of Maryland; M.S. 1951, Ph.D. 1959, George Washington University
- Attila Sakir Cigtay, *Assistant Clinical Professor of Radiology*
M.D. 1956, Istanbul University, Turkey
- Harold William Clark, Jr., *Associate Research Professor of Medicine (Biochemistry)*
B.A. 1947, College of Wooster; Ph.D. 1952, University of Rochester
- Hugh Gambel Clark, *Assistant Clinical Professor of Pediatrics*
B.A. 1930, Howard Payne College; M.D. 1934, University of Texas at Austin
- Ronald Grey Clark, *Assistant Professorial Lecturer in Anatomy*
B.A. 1960, Johns Hopkins University; M.S. 1963, Ph.D. 1966, George Washington University
- James McClay Close, *Clinical Instructor in Obstetrics and Gynecology*
B.A. 1951, Virginia Military Institute; M.D. 1955, University of Maryland
- Charles Seymour Coakley, *Professor of Anesthesiology*
M.D. 1937, George Washington University
- Kenneth Rae Coburn, *Professorial Lecturer in Physiology*
B.S. 1948, Hillsdale College; Ph.D. 1960, Ohio State University
- George Joel Cohen, *Assistant Clinical Professor of Pediatrics*
M.D. 1950, George Washington University
- Victor Hugo Cohn, Jr., *Associate Professor of Pharmacology*
B.S. 1952, Lehigh University; M.A. 1954, Harvard University; Ph.D. 1961, George Washington University
- Allan Bertram Coleman, *Associate Clinical Professor of Pediatrics*
M.D. 1943, George Washington University
- Mary Loretto Coleman, *Assistant Professor of Neurology*
B.A. 1949, University of Chicago; M.A. 1957, Johns Hopkins University; M.D. 1960, George Washington University
- Roy Melvin Coleman, *Assistant Professor of Psychiatry*
B.A. 1952, Harvard University; M.D. 1959, University of Rochester
- Richard Conant, *Clinical Instructor in Orthopaedic Surgery*
B.A. 1959, Rutgers University; M.D. 1963, State University of New York, Upstate Medical Center
- Joseph Francis Conlon, *Clinical Instructor in Surgery (Oral)*
D.D.S. 1934, Georgetown University
- Nathaniel Thomas Connally, *Clinical Instructor in Medicine*
B.A. 1958, M.D. 1962, University of Virginia
- Steven Joseph Conway, *Clinical Instructor in Medicine*
B.S. 1955, University of Notre Dame; M.D. 1959, Georgetown University
- Charles Barrie Cook, *Assistant Clinical Professor of Pathology*
B.S. 1945, Hampden-Sydney College; M.D. 1948, George Washington University
- Stewart Dallas Cooley, *Clinical Instructor in Obstetrics and Gynecology*
B.S. 1957, Ohio State University; M.D. 1961, University of Cincinnati
- Francis Donald Cooney, *Clinical Instructor in Neurological Surgery*
B.S. 1959, King's College, Pennsylvania; M.D. 1965, University of Pittsburgh
- Charles David Cooper, *Assistant Clinical Professor of Medicine*
B.A. 1948, M.D. 1951, George Washington University
- James Kyle Cooper, *Assistant Professor of Medicine*
B.A. 1958, University of Kentucky; M.D. 1962, Vanderbilt University
- William Hurlbert Cooper, *Assistant Clinical Professor of Obstetrics and Gynecology*
B.A. 1946, Case Western Reserve University; M.D. 1949, George Washington University

- Bernard Robert Cooperman, *Assistant Clinical Professor of Medicine*
B.A. 1946, M.D. 1949, George Washington University
- Milton Corn, *Associate Professor of Medicine*
B.S. 1952, M.D. 1955, Yale University
- Roger Detlef Cornell, *Clinical Instructor in Radiology*
B.S. 1951, Davidson College; M.D. 1955, University of Maryland
- Frank Duncan Costenbader, *Clinical Professor of Ophthalmology*
B.S. 1925, Hampden-Sydney College; M.D. 1929, University of Virginia
- Gertrude Cotts, *Assistant Clinical Professor of Psychiatry*
M.D. 1935, Friedrich Wilhelm University, Germany
- Laurence Ari Cove, *Assistant Clinical Professor of Pediatrics (Psychiatry)*
B.A. 1955, Columbia University; M.D. 1959, State University of New York, Downstate Medical Center
- Daniel David Cowell, *Assistant Clinical Professor of Psychiatry*
B.A. 1956, University of Pennsylvania; M.D. 1960, Seton Hall University
- John Brown Craft, Jr., *Instructor in Anesthesiology*
B.A. 1959, Johns Hopkins University; M.D. 1963, Georgetown University
- Louis Aleck Craig, Jr., *Assistant Clinical Professor of Medicine*
B.A. 1939, Georgetown University; M.D. 1943, Johns Hopkins University
- Marjorie Broer Creelman, *Assistant Clinical Professor of Psychiatry (Psychophysiology)*
B.A. 1931, Vassar College; M.A. 1932, Columbia University; Ph.D. 1954, Case Western Reserve University
- Elizabeth Amanda Crisp, *Clinical Instructor in Obstetrics and Gynecology*
B.S. 1943, Texas Woman's University; M.D. 1950, Louisiana State University
- Jeremiah Keith Cromer, *Clinical Professor of Obstetrics and Gynecology*
M.D. 1929, B.A. 1931, George Washington University
- Jack Crowell, *Assistant Clinical Professor of Medicine*
B.S. 1947, M.D. 1951, George Washington University
- Brian Crowley, *Assistant Clinical Professor of Psychiatry*
M.D. 1957, Yale University
- Leon Richard Culbertson, *Professor of Urology*
B.S., M.D. 1936, University of Virginia
- Cecil Carleton Helmer Cullander, *Assistant Clinical Professor of Psychiatry*
B.S. 1944, M.D. 1946, University of Wisconsin
- Edward Earl Cunningham, *Clinical Instructor in Obstetrics and Gynecology*
B.A. 1952, Washington and Jefferson College; M.S. 1954, Duquesne University; M.D. 1960, George Washington University
- James Allen Curtin, *Associate Professor of Medicine*
B.A. 1946, Canisius College; M.D. 1950, State University of New York at Buffalo
- Leon Cytryn, *Associate Professor of Pediatrics (Psychiatry)*
M.D. 1951, University of Marburg, Germany
- Angelo D'Agostino, *Associate Professor of Psychiatry*
B.S. 1945, St. Michael's College; M.D. 1949, M.S. 1953, Tufts University
- Gordon Walford Daisley, Jr., *Clinical Instructor in Pediatrics*
B.A. 1946, Dartmouth College; M.D. 1948, George Washington University
- Abraham Wolffe Danish, *Assistant Clinical Professor of Medicine*
B.A. 1938, M.D. 1941, George Washington University
- Stuart Henry Danovitch, *Assistant Professor of Medicine*
B.A. 1957, Harvard University; M.D. 1960, Northwestern University
- Donald William Datlow, *Clinical Instructor in Medicine*
B.S. 1952, M.S. 1954, George Washington University; M.D. 1960, University of Maryland
- William Davidson, *Assistant Clinical Professor of Psychiatry*
B.S. 1947, M.S. 1948, M.D. 1953, Duke University

- David Stanley Davis, *Assistant Clinical Professor of Medicine*
B.A. 1950, M.D. 1953, George Washington University
- Miryam Maltinskis Davis, *Clinical Instructor in Neurology*
M.D. 1957, University of Buenos Aires, Argentina
- Robert Day, *Assistant Clinical Professor of Ophthalmology*
B.A. 1936, Harvard University; M.D. 1943, Johns Hopkins University
- Edwin Justin Dealy, *Assistant Clinical Professor of Anesthesiology*
B.A. 1929, Columbia University; M.D. 1933, State University of New York, Downstate Medical Center
- Rosalie Frances De Giovanni-Donnelly, *Assistant Professorial Lecturer in Microbiology*
B.A. 1947, M.A. 1953, Brooklyn College; Ph.D. 1961, Columbia University
- Ronald Stuart Deitch, *Clinical Instructor in Ophthalmology*
B.A. 1954, Washington and Lee University; M.D. 1958, George Washington University
- Anatole Stephen Dekaban, *Associate Clinical Professor of Neurology*
M.D. 1939, Warsaw University, Poland; M.S. 1951, Ph.D. 1954, McGill University, Canada
- Donald William Delaney, *Associate Professor of Pediatrics*
B.S. 1949, St. Michael's College; M.D. 1954, Georgetown University
- Armando Antonio de Moya, *Clinical Instructor in Obstetrics and Gynecology*
M.D. 1960, Wake Forest University
- Elma Sitomer Denham, *Assistant Clinical Professor of Pediatrics (Psychiatry)*
B.A. 1947, University of Wisconsin; M.S.W. 1952, University of Pennsylvania
- Fletcher Carl Derrick, Jr., *Professor of Urology*
B.S. 1955, Clemson University; M.D. 1958, Medical College of South Carolina
- Dionisios Peter Devaris, *Assistant Clinical Professor of Pediatrics (Psychiatry)*
B.A. 1951, Cornell University; M.D. 1955, State University of New York, Downstate Medical Center
- Gilbert Bryan Devey, *Associate Professorial Lecturer in Clinical Engineering*
B.S. 1946, Massachusetts Institute of Technology
- Herbert Harold Diamond, *Clinical Instructor in Pediatrics*
M.D. 1936, George Washington University
- Kenneth James Dickie, *Instructor in Medicine*
M.D. 1963, University of Toronto, Canada
- Joseph Amedeo Di Paolo, *Associate Professorial Lecturer in Anatomy*
B.A. 1948, Wesleyan University; M.S. 1949, Case Western Reserve University; Ph.D. 1951, Northwestern University
- Larry Dizmang, *Assistant Clinical Professor of Psychiatry*
B.A. 1958, University of California, Berkeley; M.D. 1961, University of California, San Francisco
- William Octavius Dobbins III, *Associate Professor of Medicine*
M.D. 1957, University of Alabama
- William Henry Dobbs, *Clinical Instructor in Psychiatry*
B.S. 1949, M.D. 1952, Emory University
- Andrew Ivo Dobranski, *Clinical Instructor in Orthopaedic Surgery (Anatomy)*
M.D. 1954, Medical Academy of Warsaw, Poland
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B.A. 1944, M.D. 1948, Cornell University
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B.S. 1934, University of Wisconsin; M.D. 1937, Northwestern University
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B.A. 1958, Emory University; M.D. 1963, Harvard University
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B.S. 1942, Trinity College, Connecticut; M.D. 1945, Jefferson Medical College of Philadelphia
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B.A. 1949, Harvard University; M.D. 1953, Yale University
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B.A. 1952, Amherst College; M.D. 1958, George Washington University
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B.S. 1950, Massachusetts Institute of Technology
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B.S. 1939, M.D. 1942, University of Chicago
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B.A. 1959, Ph.D. 1965, University of Minnesota
- Harold Abraham Greenberg, *Assistant Clinical Professor of Psychiatry*
B.A. 1942, M.D. 1945, Temple University
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B.A. 1956, B.S. 1957, M.D. 1959, University of Minnesota
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B.A. 1937, M.D. 1941, George Washington University
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B.S. 1949, M.D. 1953, Wake Forest University
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B.S. 1948, M.S. 1950, Ph.D. 1953, Ohio State University
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M.D. 1949, University of Louisville
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B.A., M.D. 1931, Johns Hopkins University
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B.A. 1953, Kenyon College; M.D. 1962, George Washington University
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B.S. 1959, St. Joseph's College, Pennsylvania; M.D. 1963, Hahnemann Medical College
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B.A. 1929, College of Wooster; M.D. 1938, Columbia University
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B.A. 1960, University of Pennsylvania; M.D. 1964, Georgetown University
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B.A. 1936, Muhlenberg College; M.A. 1938, University of Texas at Austin; M.D. 1943, Johns Hopkins University
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- Dorothy Spatz Huntington, *Associate Research Professor of Pediatrics (Child Development)*
B.A. 1948, Barnard College; M.A. 1952, Ph.D. 1953, Harvard University
- Francis Leo Hurley, *Assistant Professor of Epidemiology and Environmental Health*
B.S. 1966, Georgetown University
- Gilbert Hurwitz, *Assistant Clinical Professor of Medicine*
B.S. 1954, M.D. 1956, University of Maryland
- Arthur Proctor Hustead, *Assistant Clinical Professor of Neurological Surgery*
B.S. 1949, M.D. 1952, Yale University
- Gerard Inguagiato, *Clinical Instructor in Surgery*
B.S. 1937, Manhattan College; M.D. 1941, Georgetown University
- Vincent Michael Iovine, *Clinical Professor of Surgery*
B.S. 1931, Manhattan College; M.D. 1935, Columbia University
- Hiltje Cath Irausquin, *Research Instructor in Pediatrics (Biochemistry)*
Ph.D. 1969, University of Amsterdam, The Netherlands
- Nelson Sumner Irey, *Clinical Professor of Pathology*
B.S. 1935, M.D. 1938, University of Pittsburgh
- Norman Harry Isaacson, *Assistant Clinical Professor of Surgery*
B.A. 1941, M.D. 1944, New York University

* On sabbatical leave July 1–November 30, 1970.

- Caroline Jackson, *Assistant Clinical Professor of Obstetrics and Gynecology*
B.A. 1929, University of California, Berkeley; M.A. 1933, Columbia University; M.D. 1937, Johns Hopkins University
- Michael John Jackson, *Assistant Professor of Physiology*
B.S. 1963, University of London, England; Ph.D. 1966, Sheffield University, England
- Cecil Bryant Jacobson, *Assistant Professor of Obstetrics and Gynecology*
B.S. 1960, University of Utah; M.D. 1964, George Washington University
- Marshall Hannis Jacobson, *Associate Clinical Professor of Medicine*
B.A. 1945, M.D. 1948, George Washington University
- Louis Sidney Jaffe, *Associate Clinical Professor of Epidemiology and Environmental Health*
B.S. 1933, Brooklyn College; M.A. 1934, Columbia University
- Irwin Sidney Jaffee, *Clinical Instructor in Otolaryngology*
B.A. 1952, New York University; M.D. 1956, State University of New York, Downstate Medical Center
- William James Jaffurs, *Associate Clinical Professor of Pathology*
B.S. 1948, Pennsylvania State University; M.D. 1952, Jefferson Medical College of Philadelphia
- Ruth Elizabeth Kerr Jakoby, *Assistant Clinical Professor of Neurological Surgery*
B.A. 1949, Barnard College; M.D. 1953, Columbia University
- Leo Janis, *Clinical Instructor in Medicine*
B.A. 1942, Ohio State University; M.D. 1946, George Washington University
- Frank Skiff Jannotta, *Associate Professor of Pathology*
B.A. 1951, Williams College; M.D. 1955, University of Pennsylvania
- William Dabney Jarman, *Clinical Professor of Urology*
B.S. 1927, Hampden-Sydney College; M.D. 1932, University of Virginia
- Frank Joseph Jarsen, *Assistant Clinical Professor of Medicine*
B.A. 1928, M.D. 1932, Johns Hopkins University
- Garth Louray Jarvis, *Assistant Clinical Professor of Obstetrics and Gynecology*
B.A. 1938, Battle Creek College; M.D. 1943, University of Michigan
- Wallace Norup Jensen, *Professor of Medicine*
B.A. 1942, M.D. 1945, University of Utah
- Hemant Joglekar, *Instructor in Medicine*
M.D. 1964, B.J. Medical College, University of Poona, India
- Brian Frank Johnson, *Assistant Research Professor of Medicine (Clinical Pharmacology)*
M.B., B.S. 1958, D.C.H. 1959, University of London, England
- Lent Clifton Johnson, *Special Lecturer in Pathology*
B.S. 1931, M.D. 1935, University of Chicago
- Thomas Nick Johnson, *Professor of Anatomy*
B.S. 1944, St. Ambrose College; M.S. 1949, Michigan State University; Ph.D. 1953, University of Michigan
- Vincent Johnson, Jr., *Instructor in Medicine*
B.A. 1964, Princeton University; M.D. 1968, Case Western Reserve University
- Warren Charles Johnson, *Assistant Clinical Professor of Psychiatry*
B.S. 1944, Seattle University; M.D. 1947, St. Louis University
- Joseph Boudinot Johnston, Jr., *Assistant Clinical Professor of Radiology (Radiobiology)*
B.S. 1936, Davidson College; M.D. 1940, Tulane University of Louisiana
- Werner Robert Jondorf, *Associate Research Professor of Pharmacology*
B.S. 1950, University of Wales; Ph.D. 1956, University of London, England
- Charles Wilson Jones, *Associate Clinical Professor of Medicine*
B.A. 1935, Johns Hopkins University; M.D. 1939, University of Maryland
- George Joseph, *Clinical Instructor in Pediatrics*
B.S. 1957, University of Madras, India; M.B., B.S. 1962, Kerala University, India; M.P.H. 1969, Johns Hopkins University

- John Kafka, *Associate Clinical Professor of Psychiatry*
B.A. 1944, Central YMCA Community College; M.S. 1947, University of Chicago; M.D. 1951, Emory University
- Irwin Howard Kaiser, *Associate Clinical Professor of Psychiatry*
B.A. 1945, Brown University; M.D. 1948, New York Medical College
- Paula Reines Kaiser, *Associate Professor of Anesthesiology*
M.B., Ch.B. 1936, University of St. Andrews, Scotland; M.D. 1937, State University of New York
- Kenneth Graham Kassebaum, *Clinical Instructor in Pediatrics*
B.A. 1956, Grinnell College; M.D. 1960, Northwestern University
- Edward Naim Kassira, *Assistant Professor of Epidemiology and Environmental Health*
M.B., Ch.B. 1959, University of Baghdad, Iraq; M.P.H. 1965, Johns Hopkins University; M.S. in Hygiene 1967, Harvard University; Ph.D. 1970, George Washington University
- Sol Katz, *Special Lecturer in Medicine (Pulmonary Disease)*
B.S. 1935, City College, New York; M.D. 1939, Georgetown University
- Morton Selwyn Kaufman, *Associate Clinical Professor of Obstetrics and Gynecology*
B.A. 1930, University of Michigan; M.D. 1934, University of Louisville
- Richard Miles Kaufman, *Clinical Instructor in Medicine*
B.A. 1955, M.D. 1958, George Washington University
- Ronald Paul Kaufman, *Associate Professor of Medicine; Medical Director, University Hospital*
B.S. 1951, Trinity College, Connecticut; M.D. 1955, University of Pennsylvania
- George Gordon Kay, *Clinical Instructor in Medicine*
B.S. 1952, Dartmouth College; M.D. 1960, Case Western Reserve University
- Charles Keck, *Associate Clinical Professor of Orthopaedic Surgery*
B.A. 1949, M.D. 1953, Duke University
- Christine Waples Kehne, *Assistant Clinical Professor of Psychiatry*
B.A. 1942, Bryn Mawr College; M.D. 1949, Johns Hopkins University
- Wilmer Deaver Kehne, *Associate Clinical Professor of Psychiatry*
B.A. 1942, Amherst College; M.D. 1945, Johns Hopkins University
- Robert Keimowitz, *Assistant Professor of Medicine*
B.A. 1961, M.S. 1963, M.D. 1965, University of Vermont
- George Archibald Kelser, Jr., *Professor of Medicine*
B.S. 1946, Harvard University; M.D. 1949, George Washington University
- Ludwig George Kempe, *Associate Clinical Professor of Neurological Surgery*
B.S. 1933, M.S. 1936, Gymnasium Königsberg, Germany; M.D. 1942, University of Berne, Switzerland
- John Kenealy, *Clinical Instructor in Urology*
B.A. 1948, Syracuse University; M.D. 1952, State University of New York, Upstate Medical Center
- Peter Kenmore, *Associate Professor of Orthopaedic Surgery*
M.D. 1947, Hahnemann Medical College
- Marie-Louise Levy Kennedy, *Associate Professor of Anesthesiology*
B.S. 1943, College De Ville Franche, De Rouergue, France; M.D. 1952, Strasbourg Medical School, France
- Harris Kenner, *Clinical Instructor in Medicine*
B.A. 1956, University of Rochester; M.D. 1960, State University of New York at Buffalo
- Richard Alec Kenney, *Professor of Physiology*
B.S. 1945, Ph.D. 1947, University of Birmingham, England
- Stephen Gabriel Kent, *Assistant Professor of Pathology*
B.A. 1956, M.D. 1960, Case Western Reserve University
- John Mark Keshishian, *Assistant Clinical Professor of Surgery*
M.D. 1950, George Washington University

- Israel Kessler, *Associate Clinical Professor of Medicine*
B.A. 1929, M.S. 1930, University of Pennsylvania; M.D. 1934, Temple University
- David Morton Kessner, *Assistant Clinical Professor of Medicine*
B.S. 1954, University of Arizona; M.D. 1958, Washington University
- Harry Jay Kicherer, *Associate Clinical Professor of Radiology*
M.D. 1948, George Washington University
- Sherman Newton Kieffer, *Clinical Professor of Psychiatry*
B.S. 1940, Illinois Institute of Technology; M.A. 1942, M.D. 1950, University of Minnesota
- Hyun Wha Kim, *Assistant Professor of Pediatrics*
M.D. 1942, To-Ho University, Japan
- Kwang Suh Kim, *Associate Research Professor of Pharmacology*
M.D. 1947, Seoul National University, Korea; M.S. 1949, Ph.D. 1952, University of Illinois
- John Harry King, Jr., *Clinical Professor of Ophthalmology*
B.S. 1932, M.D. 1934, Georgetown University
- Joseph King, *Associate Clinical Professor of Medicine*
B.A. 1941, Princeton University; M.D. 1944, Johns Hopkins University
- Charles William Kinzer, *Clinical Instructor in Medicine*
B.A. 1952, University of Virginia; M.D. 1957, Virginia Commonwealth University Medical College of Virginia
- Arthur Hiram Kiracofe, Jr., *Assistant Clinical Professor of Psychiatry*
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- Stanley Martin Kirson, *Assistant Clinical Professor of Surgery*
B.A., M.D. 1957, George Washington University
- Stanley William Kirstein, *Associate Clinical Professor of Medicine*
B.A. 1939, M.D. 1943, George Washington University
- Hans Joachim Klapproth, *Clinical Instructor in Urology*
M.D. 1951, University of Hamburg, Germany
- Jack Kleh, *Associate Clinical Professor of Medicine*
B.A. 1942, M.D. 1944, George Washington University
- Morris Kleinerman, *Clinical Professor of Psychiatry*
B.S. 1929, City College, New York; M.D. 1933, University of St. Andrews, Scotland
- Philip Alvin Klieger, *Associate Clinical Professor of Medicine*
M.D. 1939, University of Lausanne, Switzerland
- Charles Herman Klinglenmaier, *Assistant Professor of Anesthesiology*
B.A. 1960, Haverford College; M.D. 1964, University of Pennsylvania
- Calvin Trexler Klopp, *Warwick Professor of Surgery (Cancer); Medical Director, University Clinic*
B.A. 1934, Swarthmore College; M.D. 1938, Harvard University
- Philip Klubes, *Assistant Professor of Pharmacology*
B.S. 1956, Queens College, New York; M.S. 1959, Ph.D. 1962, University of Minnesota
- Henry Donald Knox, *Assistant Clinical Professor of Pediatrics*
B.A. 1953, University of Pennsylvania; M.D. 1957, Jefferson Medical College of Philadelphia
- Robert Ormiston Knox, *Clinical Instructor in Medicine*
B.A. 1947, M.D. 1950, George Washington University
- Alvin Bernt Clifford Knudson, *Assistant Clinical Professor of Medicine*
B.S. 1937, M.B. 1938, M.D. 1939, University of Minnesota
- Marilyn Jean Koering, *Assistant Professor of Anatomy*
B.A. 1960, College of St. Scholastica; M.S. 1963, Ph.D. 1967, University of Wisconsin
- Leonard Kogan, *Clinical Instructor in Ophthalmology*
M.D. 1957, University of Maryland
- Yeong-Cheol Koh, *Assistant Clinical Professor of Surgery*
M.D. 1949, Seoul National University, Korea

- Edward Ronald Kolvereid, *Clinical Instructor in Obstetrics and Gynecology*
B.S. 1956, Ohio University; M.D. 1960, Ohio State University
- Marvin Curtis Korengold, *Clinical Instructor in Neurology*
D.D.S. 1945, B.S. 1947, M.B. 1949, M.D. 1950, University of Minnesota
- Herbert Louis Kotz, *Assistant Clinical Professor of Obstetrics and Gynecology*
B.A. 1953, M.D. 1956, George Washington University
- Norman Clifford Kramer, *Associate Professor of Medicine*
B.S. 1948, The Citadel; M.S. 1950, M.D. 1954, George Washington University
- Robert Kramer, *Clinical Instructor in Medicine*
B.A. 1949, Indiana University; M.D. 1956, University of Geneva, Switzerland
- Ernest Nissley Kraybill, *Assistant Professor of Pediatrics*
B.S. 1958, Eastern Mennonite College; M.D. 1962, University of Pennsylvania
- Scheldon Kress, *Clinical Instructor in Medicine*
B.S. 1952, M.D. 1956, University of Maryland
- Morris Edward Krucoff, *Assistant Clinical Professor of Otolaryngology*
B.S. 1937, M.D. 1942, George Washington University
- William Kurstin, *Assistant Clinical Professor of Medicine*
B.S. 1941, M.D. 1943, George Washington University
- Stephen Jay Kurzbard, *Assistant Professor of Radiology*
B.A. 1958, New York University; M.D. 1962, Yeshiva University
- Edward Irving Kushner, *Associate Clinical Professor of Psychiatry*
B.S. in Med. 1947, University of Nebraska; M.D. 1949, New York Medical College
- Sau-Wah Kwan, *Instructor in Pharmacology*
B.S. 1965, Ph.D. 1969, McGill University, Canada
- William Thurston Lady, *Associate Clinical Professor of Obstetrics and Gynecology*
M.D. 1938, George Washington University
- Edwin Roth Lamm, *Clinical Instructor in Surgery*
B.A. 1956, New York University; M.D. 1960, State University of New York at Buffalo
- Gerda Weinreich Landman, *Special Lecturer in Dermatology*
M.D. 1939, University of Zurich, Switzerland
- Manuel Landman, *Assistant Clinical Professor of Dermatology*
B.S. 1933, M.D. 1941, George Washington University
- James Richard Landoll, *Assistant Professor of Clinical Engineering*
B.E.E. 1961, University of Detroit
- Herbert Edward Lane, Jr., *Clinical Instructor in Orthopaedic Surgery*
M.D. 1947, Georgetown University
- Stanley Robert Lane, *Instructor in Pediatrics*
B.A. 1962, M.D. 1966, New York University
- Gerald Sidney Lang, *Instructor in Clinical Engineering*
B.S. 1951, Long Island University; B.S. in E.E. 1958, City College, New York
- Leroy Lester Langley, *Special Lecturer in Physiology*
B.A. 1938, University of California, Los Angeles; M.A. 1939, Stanford University; Ph.D. 1942, Yale University
- David Arthur Lanham, *Assistant Clinical Professor of Psychiatry*
B.S. 1951, M.D. 1955, St. Louis University
- David Lloyd Lanter, *Clinical Instructor in Ophthalmology*
B.S. 1959, Queens College, New York; M.D. 1963, New York Medical College
- John LaRosa, *Assistant Professor of Medicine*
B.S. 1961, M.D. 1965, University of Pittsburgh
- Leonard Laster, *Professorial Lecturer in Physiology*
B.A. 1949, M.D. 1950, Harvard University
- Erika Daucher Latchis, *Clinical Instructor in Obstetrics and Gynecology*
Physikum 1959, University of Würzburg, Germany; M.D. 1963, University of Munich, Germany

- Kenneth Spero Latchis, *Clinical Instructor in Surgery*
B.A. 1957, Brown University; M.D. 1961, University of Vermont
- John Wilmer Latimer, Jr., *Associate Clinical Professor of Medicine*
M.D. 1940, George Washington University
- Henry Prather Laughlin, *Associate Clinical Professor of Psychiatry*
B.S. 1937, Ursinus College; M.D. 1941, Temple University
- Robert Alan Lavine, *Assistant Professor of Physiology*
B.S. 1962, Ph.D. 1969, University of Chicago
- Stanford Lavine, *Clinical Instructor in Orthopaedic Surgery*
B.A. 1950, M.D. 1954, University of Maryland
- Charles Edward Law, *Assistant Clinical Professor of Medicine*
M.D. 1939, George Washington University
- Arnold Albert Lear, *Assistant Clinical Professor of Medicine*
M.D. 1950, Harvard University
- Henry David Lederer, *Professorial Lecturer in Psychiatry*
B.S. 1934, M.D. 1937, University of Chicago
- David Lee, *Instructor in Clinical Engineering*
B.S. (Electronics) 1964, George Washington University
- James Alfred Lee, *Assistant Professorial Lecturer in Epidemiology and Environmental Health*
B.S. 1949, Union College, New York; M.S. 1951, Cornell University; M.Phil. 1969, Ph.D. 1970, George Washington University
- Leonard Lefkowitz, *Assistant Clinical Professor of Pediatrics*
B.A. 1957, Alfred University; M.D. 1962, Chicago Medical School
- Marvin Seymour Legator, *Professorial Lecturer in Microbiology (Microbial Genetics)*
B.A., M.S. 1948, Ph.D. 1951, University of Illinois
- Glenn Duane Legler, *Clinical Instructor in Psychiatry*
B.A. 1954, St. Olaf College; M.D. 1958, University of Wisconsin
- Harold Bernard Lehrman, *Associate Clinical Professor of Psychiatry*
B.A. 1939, Bowdoin College; M.D. 1943, Tufts University
- Sanford Leon Leikin, *Professor of Pediatrics*
M.D. 1947, University of Louisville
- Paul Reuben Lenz, *Clinical Instructor in Medicine*
B.S. 1954, M.D. 1960, Hebrew University, Israel
- Edward Joseph Leonard, *Assistant Clinical Professor of Medicine*
M.D. 1949, Harvard University
- Edwin Milton Lerner II, *Professorial Lecturer in Microbiology*
B.A. 1941, M.D. 1944, Harvard University
- Lawrence Stephen Lessin, *Associate Professor of Medicine*
M.D. 1962, University of Chicago
- Gordon Sparks Letterman, *Professor of Surgery (Plastic)*
B.A. 1937, B.S. in Med.Sc. 1940, M.D. 1941, Washington University
- Sanford Leslie Levin, *Clinical Instructor in Pediatrics*
B.A. 1961, Johns Hopkins University; M.D. 1965, University of Maryland
- Jack Louis Levine, *Assistant Clinical Professor of Otolaryngology*
M.D. 1938, George Washington University
- William Lewis, *Assistant Clinical Professor of Medicine*
M.D. 1941, George Washington University
- Robert Todd Lewit, *Assistant Clinical Professor of Psychiatry*
B.A. 1959, M.D. 1963, Harvard University
- Frederick Byron Liebler, *Instructor in Surgery*
B.S. 1958, University of Pittsburgh; M.D. 1962, George Washington University

- Charles Lightdale, *Clinical Instructor in Medicine*
B.A. 1962, Princeton University; M.D. 1966, Columbia University
- John Russell Lilly, *Associate Professor of Surgery*
B.S. 1951, M.D. 1954, University of Wisconsin
- Robert John Lindeman, *Clinical Instructor in Medicine*
B.A. 1957, Haverford College; M.D. 1961, Temple University
- Joseph Lindsay, Jr., *Associate Professor of Medicine*
B.S. 1954, Clemson University; M.D. 1958, Emory University
- Daniel Gordon Lipman, *Clinical Instructor in Psychiatry*
M.D. 1940, Middlesex Hospital Medical School, England
- George Liss, *Clinical Instructor in Ophthalmology*
B.A. 1955, M.D. 1958, George Washington University; M.S. 1964, Marquette University
- Leon McNeely Liverett, *Assistant Clinical Professor of Obstetrics and Gynecology*
B.S. 1943, Butler University; M.D. 1945, Indiana University
- Jean Douglas Lockhart, *Clinical Instructor in Pediatrics*
B.A. 1944, Vassar College; M.D. 1951, Georgetown University
- Ann Lodge, *Assistant Research Professor of Pediatrics (Child Development)*
B.A. 1955, Wilkes College; Ph.D. 1960, Duke University
- John Hayes Lodge, *Assistant Clinical Professor of Ophthalmology*
B.A. 1947, West Virginia University; M.D. 1951, Johns Hopkins University
- James Walling Long, *Assistant Clinical Professor of Medicine*
M.D. 1943, George Washington University
- Ruben Lopez-Toca, *Assistant Clinical Professor of Medicine*
B.S., B.A. 1934, Instituto Provincial, Cuba; M.D. 1941, University of Havana, Cuba
- Joseph Michael LoPresti, *Professorial Lecturer in Radiology (Pediatric)*
B.S. 1942, St. Peter's College; M.D. 1945, Georgetown University
- Carl Douglas Lord, *Clinical Instructor in Obstetrics and Gynecology*
B.A. 1962, Columbia Union College; M.D. 1966, Loma Linda University
- Samuel Dennis Loube, *Associate Clinical Professor of Medicine*
B.A. 1941, M.D. 1943, George Washington University
- Robert Guthrie Loudon, *Associate Professor of Medicine*
M.B., Ch.B. 1947, University of Edinburgh, Scotland
- Reginald Spencer Lourie, *Professor of Pediatrics (Psychiatry)*
B.S. 1930, Cornell University; M.D. 1936, State University of New York, Downstate Medical Center; Med.Sc.D. 1941, Columbia University
- Clarence Alfred Lowe, *Associate Dean of the Medical Center, for Research*
B.A. 1934, West Liberty State College; Ed.M. 1937, University of Pittsburgh
- Jean Pitner Lucas, *Assistant Clinical Professor of Medicine*
B.A. 1944, B.S. 1946, University of Mississippi; M.D. 1948, George Washington University
- Victor Frederick Ludewig, *Administrator of the University Hospital and Clinic*
B.S. 1931, University of California, Berkeley; B.S. 1934, Cornell University
- Daniel Francis Lynch, *Special Lecturer in Surgery (Oral)*
D.D.S. 1925, University of Maryland
- Joseph Leo Mabon, *Instructor in Psychiatry (Social Work)*
B.A. 1964, St. Francis College, Pennsylvania; M.S.W. 1968, Catholic University of America
- Gordon Rhodes MacDonald, *Assistant Clinical Professor of Urology*
B.S. 1939, University of Toledo; M.D. 1943, George Washington University
- Thayer Mills Mackenzie, *Assistant Clinical Professor of Psychiatry*
B.S. 1944, Harvard University; M.D. 1947, Johns Hopkins University
- Ivan Vasil Magal, *Clinical Instructor in Medicine*
Th.B. 1944, Baptist Theological Seminary, Hungary; B.A. 1948, Eastern Mennonite College; B.S. 1949, Lebanon Valley College; M.D. 1954, Virginia Commonwealth University Medical College of Virginia

- Iradj Mahdavi, *Clinical Instructor in Pediatrics*
M.D. 1956, University of Tehran, Iran
- John Maier, *Associate Clinical Professor of Radiology*
M.D. 1952, St. Louis University; M.S. 1959, University of Colorado; Ph.D. 1963, University of Rochester
- Massoud Majd-Ardekani, *Assistant Professor of Radiology*
M.D. 1960, University of Tehran, Iran
- Eleanor Lewis Makel, *Assistant Clinical Professor of Medicine*
B.S. 1938, Howard University; M.D. 1943, Meharry Medical College
- Michael Joseph Malone, *Professor of Neurology*
B.A. 1951, Boston College; M.D. 1956, Georgetown University
- Benjamin Manchester, *Clinical Professor of Medicine*
M.D. 1935, George Washington University
- *Harold George Mandel, *Professor of Pharmacology*
B.S. 1944, Ph.D. 1949, Yale University
- Dertad Manguikian, *Instructor in Ophthalmology*
B.S. 1962, M.D. 1966, American University of Beirut, Lebanon
- Hildegard Wessel Manitsas, *Assistant Professor of Anesthesiology*
M.D. 1951, Free University of Berlin, Germany
- James Packard Mann, *Associate Clinical Professor of Medicine*
M.D. 1947, George Washington University
- Emanuele Mannarino, *Assistant Professor of Neurological Surgery*
M.D. 1951, University of Rome, Italy; M.D. 1963, Duke University
- Nicholas Emmanuel Manos, *Assistant Professorial Lecturer in Epidemiology and Environmental Health*
B.A. 1938, University of California, Berkeley; M.A. 1942, University of California, Davis
- Allen Elias Marans, *Assistant Clinical Professor of Pediatrics (Psychiatry)*
M.D. 1949, Georgetown University
- Andrew Menges Margileth, *Professor of Pediatrics*
B.A. 1943, Washington and Jefferson College; B.S. 1944, Massachusetts Institute of Technology; M.D. 1947, University of Cincinnati
- David Mervyn Margulies, *Clinical Instructor in Obstetrics and Gynecology*
B.S. 1956, Columbia University; M.D. 1961, Northwestern University
- Irwin Henley Marill, *Associate Clinical Professor of Psychiatry*
B.A. 1950, Brown University; M.D. 1954, Hahnemann Medical College
- John Lloyd Marlow, *Assistant Professor of Obstetrics and Gynecology*
B.S. 1957, Brigham Young University; M.D. 1961, George Washington University
- William Laverne Marsh, *Associate Professor of Pathology*
B.S. 1942, Purdue University; M.D. 1946, State University of New York at Buffalo
- John Housden Lane Marshall, *Assistant Clinical Professor of Psychiatry*
B.S. 1958, University of Maryland; M.D. 1962, George Washington University
- Vernon Edward Martens, *Associate Clinical Professor of Pathology*
B.S. 1935, M.D. 1937, St. Louis University
- Dean Harrington Martin, *Clinical Instructor in Obstetrics and Gynecology*
M.D. 1950, George Washington University
- Robert Edward Martin, *Assistant Clinical Professor of Pediatrics*
M.D. 1947, George Washington University
- Shirley Sue Martin, *Associate Clinical Professor of Obstetrics and Gynecology*
B.A. 1940, Marshall University; M.D. 1943, Virginia Commonwealth University Medical College of Virginia
- Donald John Massaro, *Associate Professor of Medicine*
B.A. 1953, Hofstra University; M.D. 1957, Georgetown University

* On sabbatical leave 1970-71.

- Richard Gustave Masson, *Clinical Instructor in Medicine*
B.A. 1963, Providence College; M.D. 1967, Albany Medical College
- Rashid Massumi, *Associate Professor of Medicine*
M.D. 1949, University of Tehran, Iran
- Aniello Francis Mastellone, *Associate Professor of Medicine (Physical Medicine)*
B.S. 1931, Manhattan College; M.D. 1935, George Washington University
- Mary Jean Matthews, *Professorial Lecturer in Pathology*
B.A. 1946, M.D. 1949, George Washington University
- Thomas William Mattingly, *Special Lecturer in Medicine (Cardiology)*
B.S. 1928, M.D. 1930, Georgetown University
- Paul Mazel, *Associate Professor of Pharmacology*
B.S. 1946, Virginia Commonwealth University Medical College of Virginia; M.S. 1955, Trinity University; Ph.D. 1960, Vanderbilt University
- Harry Moses McAllister, *Clinical Instructor in Ophthalmology*
B.A. 1936, University of Georgia; M.D. 1949, Johns Hopkins University
- James Robert McClelland, *Clinical Instructor in Surgery*
M.D. 1951, George Washington University
- James Edward McClenathan, *Associate Professor of Surgery*
B.A. 1943, Washington and Jefferson College; M.D. 1947, University of Pittsburgh
- Richard Allen McConaughy, *Clinical Instructor in Medicine*
M.D. 1963, University of Michigan
- Charles Thomas McCullough, Jr., *Clinical Instructor in Orthopaedic Surgery*
B.S. 1957, University of Kentucky; M.D. 1961, Vanderbilt University
- William Stanley McCune, *Clinical Professor of Surgery*
B.A. 1931, Swarthmore College; M.D. 1935, Harvard University
- Ross Albert McElroy, *Assistant Clinical Professor of Psychiatry*
B.A. 1957, M.D. 1961, University of Texas at Austin
- James Jerry McFarland, Jr., *Associate Clinical Professor of Otolaryngology*
B.S. 1935, Cumberland College of Tennessee; M.D. 1938, University of Tennessee
- Larry McGowan, *Associate Professor of Obstetrics and Gynecology*
B.S. 1950, Millikin University; B.S. in Med. 1952, M.D. 1954, University of Illinois
- Brady Piersol McKaig, *Assistant Clinical Professor of Psychiatry*
B.S. 1957, University of Notre Dame; M.D. 1961, Cornell University
- William Prentiss McKelway, *Associate Clinical Professor of Obstetrics and Gynecology*
B.A. 1943, Washington and Lee University; M.D. 1950, George Washington University
- Donald Harrison McKnew, Jr., *Assistant Clinical Professor of Pediatrics (Psychiatry)*
B.A. 1955, Yale University; M.D. 1961, Johns Hopkins University
- Shirley Anne McMahon, *Instructor in Pediatrics*
B.A. 1956, Middlebury College; M.D. 1965, Boston University
- Sterling Garrett Mead, *Associate Clinical Professor of Surgery (Oral)*
D.D.S. 1944, Georgetown University
- Donald Chamberlin Meek, *Clinical Instructor in Obstetrics and Gynecology*
B.A. 1957, Ohio Wesleyan University; M.D. 1961, Ohio State University
- Dale Richard Meers, *Instructor in Pediatrics (Psychiatry)*
B.A. 1950, University of Washington; M.S.W. 1956, University of Minnesota
- Franklin Meister, *Associate Clinical Professor of Neurology*
B.S. 1929, M.D. 1931, University of Wisconsin
- Robert Allen Mendelsohn, *Clinical Instructor in Neurological Surgery*
M.D. 1949, Georgetown University
- Sander Holstein Mendelson, *Instructor in Medicine*
B.A. 1956, Wesleyan University; M.D. 1960, New York University

- Jean Hugues Menetrez, *Assistant Clinical Professor of Psychiatry*
B.A. 1942, University of Besançon, France; M.D. 1950, McGill University, Canada
- Maurice Mensh, *Associate Clinical Professor of Medicine*
M.D. 1939, George Washington University
- Margaret Mercer, *Associate Clinical Professor of Psychiatry (Clinical Psychology)*
B.A. 1929, M.S. 1934, Ph.D. 1938, Pennsylvania State University
- John Frederick Mermel, *Clinical Instructor in Medicine*
B.S. 1956, Georgetown University; M.D. 1960, George Washington University
- Walter Mertz, *Special Lecturer in Biochemistry (Inorganic Metabolism)*
M.D. 1951, University of Mainz, Germany
- Alfred Michael Messore, *Assistant Clinical Professor of Psychiatry*
B.S. 1956, Mount St. Mary's College, Maryland; M.D. 1961, State University of New York at Buffalo
- Charles Walter Metz, Jr., *Assistant Clinical Professor of Orthopaedic Surgery*
B.A. 1941, M.D. 1944, Vanderbilt University
- Frederick Meyers, *Clinical Instructor in Medicine*
B.S. 1955, Purdue University; M.D. 1959, University of Cincinnati
- Herman Arnold Meyersburg, *Clinical Professor of Psychiatry*
B.S. 1933, M.D. 1938, New York University
- Thomas Herrick Milhorat, *Assistant Clinical Professor of Neurological Surgery*
B.S. 1957, M.D. 1961, Cornell University
- Hilary Ethel Clara Millar, *Clinical Instructor in Pediatrics (Psychiatry)*
M.D. 1947, Royal College of Surgeons, Scotland; M.P.H. 1958, Johns Hopkins University
- Jack William Millar, *Vivian Gill Professor of Epidemiology and Environmental Health*
B.A. 1945, Stanford University; M.D. 1947, George Washington University; M.P.H. 1951, M.S. in Hygiene and Tropical Medicine 1952, Harvard University
- Charles Henry Miller, *Assistant Professorial Lecturer in Epidemiology and Environmental Health*
B.S., M.D. 1949, University of Nebraska; M.P.H. 1963, University of Pittsburgh
- Frank Nelson Miller, Jr., *Professor of Pathology; Associate Dean of the Medical Center, for Student and Curricular Affairs*
B.S. 1943, M.D. 1948, George Washington University
- George Francis Miller, Jr., *Clinical Instructor in Otolaryngology*
M.D. 1958, George Washington University
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B.A. 1926, Wittenberg University; M.D. 1930, University of Pennsylvania
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B.A. 1946, M.A. 1948, University of California, Los Angeles; M.D. 1955, University of Chicago
- Irvin Donald Milowe, *Assistant Clinical Professor of Psychiatry*
B.A. 1953, Columbia University; M.D. 1957, Cornell University
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M.D. 1948, Seoul Women's Medical College, Korea
- Donald Mitchell, *Assistant Clinical Professor of Dermatology*
B.S. 1954, M.D. 1957, University of North Carolina at Chapel Hill
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M.D. 1934, State University of New York, Downstate Medical Center
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B.S. 1948, M.S. 1949, M.D. 1954, George Washington University
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B.A. 1958, M.D. 1961, George Washington University
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B.A. 1955, University of Virginia; M.D. 1959, Johns Hopkins University

- George Albert Morales, *Associate Professor of Anesthesiology*
B.S. 1947, M.D. 1951, University of Mexico
- David Arthur Morowitz, *Assistant Clinical Professor of Medicine*
M.D. 1963, University of Illinois
- William Fitzgerald Morrissey, *Assistant Clinical Professor of Medicine*
B.A. 1953, University of Virginia; M.D. 1957, George Washington University
- Donald Lee Morton, *Assistant Clinical Professor of Surgery*
B.A. 1955, University of California, Berkeley; M.D. 1958, University of California, San Francisco
- Herbert Alan Moskovitz, *Assistant Clinical Professor of Medicine*
B.S. 1949, Georgia Institute of Technology; M.D. 1954, Emory University
- Leland Conner Moss, *Clinical Professor of Ophthalmology*
M.B., M.D. 1929, University of Cincinnati; Med.Sc.D. 1935, Columbia University
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B.A. 1941, Union College, New York; M.D. 1944, George Washington University
- Mahmoud Mourad, *Associate Professor of Medicine*
B.S. 1940, P.N.S. 1942, M.B., B.Ch. 1952, Ibrahimieh University, Egypt; M.A. 1960, New York University
- Stephen Mourat, *Assistant Clinical Professor of Pediatrics (Psychiatry)*
B.A. 1941, West Virginia University; M.D. 1944, Jefferson Medical College of Philadelphia
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Natural Science 1950, Rahnama College, Iran; M.D. 1956, University of Tehran, Iran
- William Dufford Moyle, Jr., *Clinical Instructor in Surgery*
B.A. 1956, Wesleyan University; M.D. 1960, Cornell University
- Cornelius Francis Murphy, *Associate Professor of Radiology*
B.S. 1943, Boston College; M.D. 1956, Georgetown University
- James Peter Murphy, *Associate Clinical Professor of Neurological Surgery*
B.S. 1935, College of St. Thomas; M.D. 1939, Yale University
- Lois Barclay Murphy, *Clinical Professor of Pediatrics (Child Development)*
B.A. 1923, Vassar College; B.D. 1928, Union Theological Seminary, New York; Ph.D. 1937, Columbia University
- Daniel Bradley Murray, S.J., *Research Instructor in Clinical Engineering*
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M.B., B.S. 1963, B.J. Medical College, University of Poona, India
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B.A. 1952, Hofstra University; M.D. 1956, Yale University
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B.S. 1954, St. Louis University; M.D. 1958, University of Oklahoma
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- Robert Burwell Nelson, *Assistant Clinical Professor of Obstetrics and Gynecology*
B.A. 1932, M.D. 1936, University of Virginia

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B.S. 1948, University of Wisconsin; M.D. 1953, George Washington University
- Julius Salem Neviaser, *Clinical Professor of Orthopaedic Surgery*
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B.A. 1924, M.B. 1927, M.D. 1936, University of Toronto, Canada
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B.A. 1951, Pomona College; M.D. 1955, Johns Hopkins University
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B.A. 1958, University of Virginia; M.D. 1962, Virginia Commonwealth University Medical College of Virginia
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B.S. 1965, St. Norbert College; Ph.D. 1970, Georgetown University

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B.A. 1945, University of Kentucky; M.D. 1946, University of Louisville
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M.D. 1960, Temple University
- Arthur Peschin, *Associate Professor of Anesthesiology*
B.S. 1954, University of Alabama; M.D. 1959, Chicago Medical School
- John Emerick Peterson, *Clinical Instructor in Surgery*
B.A. 1950, M.D. 1954, Cornell University
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B.A. 1956, M.D. 1959, George Washington University
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B.A., B.S. 1928, M.D. 1931, University of Minnesota
- Joaquin Herculano Piedra, *Assistant Clinical Professor of Medicine*
M.D. 1944, University of Havana, Cuba
- Thomas Eugene Piemme, *Professor of Medicine*
B.S. 1954, M.D. 1958, University of Pittsburgh
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M.D. 1955, Georgetown University
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B.A. 1939, Marietta College; M.D., C.M. 1943, McGill University, Canada
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B.A. 1938, Fordham University; M.D. 1942, New York University
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B.A. 1931, Goucher College; M.D. 1946, University of Maryland
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Ph.B. 1945, B.S. 1947, M.D. 1949, University of Chicago
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B.S. 1951, Georgetown University; M.D. 1955, University of Maryland
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B.A. 1958, M.D. 1962, University of Pennsylvania
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B.A. 1950, M.D. 1953, George Washington University
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M.D. 1962, University of Tehran, Iran
- Jerrold Morton Post, *Assistant Clinical Professor of Psychiatry*
B.A. 1956, M.D. 1960, Yale University
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B.S. 1934, Fordham University; M.D. 1938, State University of New York, Downstate Medical Center
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B.A. 1943, M.D. 1946, George Washington University
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M.D. 1949, Royal University of Malta; D.O.M.S. 1959, University of Vienna, Austria
- Neel Jack Price, *Assistant Clinical Professor of Obstetrics and Gynecology*
B.A. 1939, B.S. 1940, M.D. 1942, University of Oklahoma
- Paul Jay Price, *Assistant Professorial Lecturer in Microbiology*
B.S. 1959, University of Maryland; M.S. 1961, Ph.D. 1964, George Washington University
- Olga Rossie Pruna, *Instructor in Medicine*
M.D. 1947, University of Havana, Cuba

- Louis Quain Pugsley, *Assistant Clinical Professor of Obstetrics and Gynecology*
B.A. 1954, Hamilton College; M.D. 1958, Cornell University
- Jose Rafael Puig, *Assistant Professor of Pediatrics*
M.D. 1950, Santo Domingo University, Dominican Republic
- Robert Earl Pumphrey, Jr., *Assistant Clinical Professor of Otolaryngology*
B.S. 1955, Denison University; M.D. 1959, Ohio State University
- Lawrence Elias Putnam, *Clinical Professor of Medicine*
B.A. 1930, M.D. 1934, Harvard University
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M.D. 1939, Duke University
- James Tindal Quattlebaum, *Assistant Clinical Professor of Psychiatry*
B.S. 1955, University of South Carolina; M.D. 1956, Medical College of South Carolina; M.A. 1961, Columbia University
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B.S. 1951, Juan Sagarra, Cuba; M.D. 1960, University of Salamanca, Spain
- Boris Rabkin, *Assistant Clinical Professor of Medicine*
B.A. 1939, New York University; M.D. 1943, George Washington University
- Luis Carlos Radice, *Clinical Instructor in Obstetrics and Gynecology*
M.D. 1957, University of Buenos Aires, Argentina
- Eric Leon Radin, *Clinical Instructor in Orthopaedic Surgery*
B.A. 1956, Amherst College; M.D. 1960, Harvard University
- Robert Douglas Ralph, *Clinical Instructor in Otolaryngology*
M.D. 1932, Queen's University, Canada
- Devanhalli Ramaswamy, *Clinical Instructor in Medicine*
M.D. 1961, University of Mysore, India
- Judson Graves Randolph, *Professor of Surgery (Pediatrics)*
B.A. 1950, M.D. 1953, Vanderbilt University
- Joseph Eugene Rankin, *Professor of Psychiatry*
B.S. 1942, Catholic University of America; M.D. 1946, George Washington University
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M.B., B.S. 1959, M.S. 1963, Andhra University, India; M.S. 1968, University of Iowa
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B.A. 1959, Columbia University; M.D. 1963, New York University
- Edward Luke Rea, *Assistant Clinical Professor of Medicine*
B.A. 1942, University of California, Berkeley; M.D. 1946, George Washington University
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B.S. 1942, Harvard University; M.D. 1945, Columbia University
- Thomas Sargent Reese, *Professorial Lecturer in Anatomy*
B.A. 1957, Harvard University; M.D. 1962, Columbia University
- Robert Michael Regan, *Clinical Instructor in Obstetrics and Gynecology*
B.A. 1957, Hamilton College; M.D. 1964, George Washington University
- Melvin Reich, *Associate Professor of Microbiology*
B.S. 1953, City College, New York; M.S. 1957, Ph.D. 1960, Rutgers University
- Thomas Elmer Reichelderfer, *Associate Clinical Professor of Pediatrics*
B.S. 1939, Rutgers University; M.D. 1950, M.P.H. 1956, Johns Hopkins University
- George Henry Reifenshtein, *Clinical Professor of Pathology*
B.A. 1932, M.D. 1936, Syracuse University
- Philip Louis Repetto, Jr., *Assistant Clinical Professor of Dermatology*
B.A. 1951, M.D. 1955, University of Pennsylvania
- Harvey Resnick, *Clinical Professor of Psychiatry*
B.A. 1951, State University of New York at Buffalo; M.D. 1955, Columbia University
- Frederick Turner Reuter, *Associate Clinical Professor of Urology*
M.D. 1944, George Washington University

- Thomas Dewitt Reynolds, *Associate Clinical Professor of Psychiatry (Experimental)*
B.A. 1949, M.D. 1955, University of Chicago
- Richard Coleman Rhame, *Assistant Clinical Professor of Urology*
B.A. 1950, Princeton University; M.D. 1954, George Washington University
- Jack Jacob Rheingold, *Clinical Professor of Medicine*
B.A. 1936, University of Alabama; M.B. 1940, M.D. 1941, University of Cincinnati
- Harvey William Rice, *Clinical Instructor in Pediatrics*
B.S. 1955, West Virginia Wesleyan College; M.D. 1959, University of Cincinnati
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B.A. 1956, Haverford College; M.D. 1960, Temple University
- Barton Winters Richwine, *Associate Clinical Professor of Obstetrics and Gynecology*
M.D. 1934, George Washington University
- Charles Rickerich, *Clinical Instructor in Surgery*
B.S. 1948, Fordham University; M.D. 1952, State University of New York, Downstate Medical Center
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B.A. 1940, Hunter College; M.A. 1941, Columbia University; M.A. 1952, Ph.D. 1960, Catholic University of America
- Charles Andrew Rigg, *Assistant Professor of Pediatrics*
M.B., B.Surg. 1951, University of Sydney, Australia
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B.A. 1927, University of Pennsylvania; M.D. 1931, Jefferson Medical College of Philadelphia
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M.D. 1959, University of Buenos Aires, Argentina
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M.B., B.S. 1953, M.D. 1957, University of Bombay, India
- Hugo Victor Rizzoli, *Clinical Professor of Neurological Surgery*
M.D. 1940, Johns Hopkins University
- David Irwin Robbins, *Assistant Professor of Radiology*
M.D. 1962, Georgetown University
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B.A. 1934, American University; M.A. 1940, Ph.D. 1944, George Washington University
- Robert Hood Robertson, *Clinical Instructor in Neurology*
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B.S. 1937, George Washington University; M.D. 1941, Georgetown University
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B.A. 1951, Mary Baldwin College; M.A. 1953, George Washington University; Ph.D. 1959, Purdue University
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B.S. 1960, Princeton University; M.D. 1964, Yeshiva University
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- Richard Allan Rogers, *Assistant Clinical Professor of Psychiatry*
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M.D. 1942, George Washington University
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B.S. 1931, City College, New York; M.D. 1935, New York University
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B.S. 1942, M.D. 1944, Tulane University of Louisiana
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B.A. 1942, M.D. 1944, Syracuse University
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B.A. 1938, M.D. 1941, George Washington University
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B.A. 1939, University of Pennsylvania; M.D. 1944, Hahnemann Medical College
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B.S. 1940, M.D. 1943, Harvard University
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B.S. 1955, University of Massachusetts; M.D. 1959, University of Vermont
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B.S. 1932, University of Virginia; M.D. 1936, Harvard University
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B.A. 1948, Princeton University; M.D. 1952, George Washington University
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- Henry Oscar Schindelar, *Clinical Instructor in Medicine*
B.S. 1952, Montana State University; M.S. 1954, University of Utah; M.D. 1958, Howard University
- Paul Schlein, *Assistant Clinical Professor of Medicine*
B.A. 1952, M.D. 1956, Cornell University
- Marvin Schneider, *Clinical Instructor in Medicine*
B.S. 1956, George Washington University; M.D. 1960, Howard University

- Richard Schoenfeld, *Clinical Instructor in Medicine; Associate University Physician*
B.S. 1954, University of Wisconsin; M.D. 1958, State University of New York, Upstate Medical Center
- James Anthony Schoettler, *Assistant Clinical Professor of Psychiatry*
B.A. 1953, Fresno State College; M.D. 1957, Johns Hopkins University
- George Jerome Schonholtz, *Assistant Clinical Professor of Orthopaedic Surgery*
B.A. 1950, New York University; M.D. 1954, State University of New York, Downstate Medical Center
- Cyril Augustus Schulman, *Associate Clinical Professor of Medicine*
B.S. 1938, M.D. 1942, George Washington University
- Charles John Schulte III, *Special Lecturer in Pediatrics*
B.A. 1958, Johns Hopkins University; M.D. 1962, Union College and University
- Maxine Ann Schurter, *Associate Clinical Professor of Surgery*
B.A. 1944, Pomona College; M.D. 1951, George Washington University
- Halbert Herman Schwamb, *Associate Clinical Professor of Neurology*
B.S. 1947, M.D. 1950, University of Nebraska; M.S. 1955, University of Colorado
- John Theodore Schwartz, *Assistant Clinical Professor of Ophthalmology*
B.A. 1947, Dartmouth College; M.S. 1950, University of Notre Dame; M.D. 1955, Jefferson Medical College of Philadelphia; M.P.H. 1963, Harvard University
- Stanley Alvin Schwartz, *Clinical Instructor in Medicine*
B.S. 1955, Alfred University; M.D. 1959, Union College and University
- Agnes Eva Schweitzer, *Clinical Instructor in Pediatrics*
B.S. 1955, M.D., C.M. 1959, McGill University, Canada
- Lewis Pennington Scott III, *Associate Professor of Pediatrics*
M.D. 1954, Jefferson Medical College of Philadelphia
- Morton Seidenfeld, *Clinical Professor of Medicine (Clinical Psychology)*
B.S. 1927, University of Washington; M.S. 1933, Ph.D. 1937, University of Pennsylvania
- Alvin Seltzer, *Assistant Clinical Professor of Medicine*
B.S. 1937, M.D. 1941, University of Illinois
- Jay Robert Shapiro, *Assistant Professor of Medicine*
B.S. 1953, Franklin and Marshall College; M.D. 1957, Boston University
- Robert David Shapiro, *Assistant Clinical Professor of Surgery (Oral)*
B.S. 1960, D.D.S. 1962, Case Western Reserve University
- George Sharpe, *Assistant Clinical Professor of Medicine*
B.A. 1938, Cornell University; M.D. 1941, University of Illinois
- Samuel Hazen Shea, *Assistant Clinical Professor of Obstetrics and Gynecology*
B.A. 1933, M.D. 1936, George Washington University
- Michael Mendel Shefferman, *Clinical Instructor in Medicine*
B.A. 1958, Johns Hopkins University; M.D. 1962, University of Maryland
- Joseph Lee Sheridan, *Associate Clinical Professor of Psychiatry*
B.A. 1939, M.D. 1943, Indiana University
- Charles Utley Shilling, *Clinical Instructor in Medicine*
M.D. 1955, George Washington University
- Charles Wesley Shilling, *Associate Professor of Medical and Public Affairs*
B.S. 1923, Sc.D. 1954, Taylor University; B.A. 1923, M.D. 1927, University of Michigan
- Paul Edgar Shorb, Jr., *Associate Professor of Surgery*
B.A. 1951, Williams College; M.D. 1955, Johns Hopkins University
- Thomas Robert Shworles, *Assistant Professor of Medicine (Social Psychology)*
B.A. 1956, Catholic University of America; M.A. 1959, George Washington University
- Fredric Abraham Siegel, *Research Instructor in Medicine*
B.S. in E.E. 1963, Polytechnic Institute of Brooklyn; M.D. 1968, State University of New York, Downstate Medical Center

- Howard Silby, *Clinical Instructor in Neurology*
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- Carlos Alberto Silva, *Clinical Instructor in Surgery*
B.S. 1956, University of Puerto Rico; M.D. 1960, George Washington University
- Harold Martin Silver, *Associate Clinical Professor of Medicine*
B.A. 1946, M.D. 1949, Columbia University
- Henry Simmons, *Associate Clinical Professor of Medicine*
B.S. 1951, M.D. 1954, University of Pittsburgh; M.P.H. 1965, Harvard University
- Kenneth Alan Simon, *Assistant Clinical Professor of Ophthalmology*
B.A. 1952, University of Pennsylvania; M.S. 1955, M.D. 1957, Yale University
- Kumar Baikunth Singh, *Assistant Professor of Medicine*
M.B., B.S. 1960, Nagpur University, India
- Maurice Arthur Sislen, *Assistant Clinical Professor of Medicine*
B.A. 1944, M.D. 1947, George Washington University
- James Glover Sites, *Professor of Obstetrics and Gynecology*
M.D. 1947, George Washington University
- Irene I-Lien Hsu Siu, *Associate Professor of Medicine*
B.S. 1946, M.D. 1949, St. John's University, China
- Albert Sjoerdsma, *Special Lecturer in Medicine (Internal)*
B.S. 1945, Ph.D. 1948, M.D. 1949, University of Chicago
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B.A. 1955, Princeton University; M.D. 1961, Hahnemann Medical College
- Benjamin Williams Smith, *Professor of Biochemistry*
B.S. 1940, Virginia Polytechnic Institute; M.S. 1947, Ph.D. 1951, George Washington University
- James Cecil Smith, Jr., *Special Lecturer in Biochemistry*
B.S. 1956, M.S. 1959, Ph.D. 1964, University of Maryland
- John Chandler Smith, *Professor of Pathology*
B.S. 1941, M.D. 1944, University of Oregon
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B.S. 1953, University of Maryland; M.D. 1957, George Washington University
- Nicholas Patrick Dillon Smyth, *Associate Clinical Professor of Surgery*
M.S. 1948, M.B., Ch.B. 1949, University College, Dublin, Ireland; M.S. 1954, University of Michigan
- Joseph Snyder, *Clinical Instructor in Ophthalmology*
B.A. 1958, University of Pennsylvania; M.D. 1962, Jefferson Medical College of Philadelphia
- Donald Bruce Sodee, *Associate Clinical Professor of Radiology (Nuclear Medicine)*
B.A. 1952, University of Michigan; M.D. 1956, Case Western Reserve University
- Edgar Henry Soifer, *Clinical Instructor in Urology*
B.A. 1953, Washington and Jefferson College; M.D. 1957, New York University
- George Andrew Solack, *Assistant Clinical Professor of Radiology*
M.D. 1960, George Washington University
- Emilio Vicente Soto, *Associate Professor of Pediatrics*
B.S. 1926, M.D. 1934, University of Havana, Cuba; M.D. in Ped. 1936, University of Pennsylvania
- Samuel Casto Southard, *Associate Clinical Professor of Pediatrics*
M.D. 1946, Hahnemann Medical College
- Peter Soyster, *Associate Clinical Professor of Obstetrics and Gynecology*
M.D. 1948, George Washington University
- George Speck, *Assistant Clinical Professor of Obstetrics and Gynecology*
B.S. 1937, University of Michigan; M.D. 1941, George Washington University
- Israel Spector, *Clinical Instructor in Medicine*
B.S. 1958, Brooklyn College; M.D. 1962, Chicago Medical School

- David Samuel Sprague, *Assistant Clinical Professor of Psychiatry*
M.D. 1959, Indiana University
- William Woodrow Stanbro, *Professor of Radiology*
M.D. 1938, Washington University
- Raymond Standard, *Associate Clinical Professor of Medicine*
B.S. 1948, M.D. 1952, Howard University; M.P.H. 1967, Johns Hopkins University
- William Stark, *Associate Clinical Professor of Pediatrics (Psychiatry)*
B.A. 1939, New York University; M.D. 1943, University of Louisville
- Henry Joseph Starr, *Clinical Instructor in Ophthalmology*
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B.S. 1943, M.S. 1950, Ph.D. 1958, University of Michigan
- Antonio Stazio, *Associate Clinical Professor of Neurology*
M.D. 1954, University of Naples, Italy
- Edward Steers, Jr., *Professorial Lecturer in Biochemistry*
B.S. 1959, Ph.D. 1963, University of Pennsylvania
- Elizabeth Weiss Stephenson, *Assistant Professor of Physiology*
B.S. 1947, University of Chicago; Ph.D. 1964, George Washington University
- Harold Stevens, *Professor of Neurology*
B.S. 1933, Pennsylvania State University; M.A. 1934, Ph.D. 1937, M.D. 1941, University of Pennsylvania
- Kingsley Morton Stevens, *Associate Professor of Medicine*
B.S. 1943, Lynchburg College; M.D. 1947, Harvard University
- Steele Fuller Stewart, Jr., *Clinical Instructor in Obstetrics and Gynecology*
B.A. 1950, Carleton College; M.D. 1959, University of Pennsylvania
- Charles Frederick Stiegler, *Assistant Clinical Professor of Pediatrics*
B.A. 1936, M.D. 1940, New York University
- William James Stockton, *Assistant Clinical Professor of Psychiatry*
M.D. 1956, University of Oklahoma
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- William Leete Stone III, *Assistant Clinical Professor of Medicine*
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B.S. 1958, Ph.D. 1963, University of Florida
- Donald Harrison Stubbs, *Clinical Professor of Anesthesiology*
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- Samuel Jacob Nathan Sugar, *Associate Clinical Professor of Medicine*
Phar.G. 1931, M.D. 1938, George Washington University
- Patrick Joseph Sullivan, *Clinical Instructor in Medicine*
B.S. 1929, M.D. 1936, Notre Dame University, Switzerland
- Thomas Sullivan, *Clinical Instructor in Pediatrics*
B.A. 1960, M.D. 1964, Seton Hall University
- Garrett Michael Swain, *Assistant Clinical Professor of Neurological Surgery*
M.D. 1945, George Washington University
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- Stanley Jerome Talpers, *Assistant Clinical Professor of Medicine*
B.A. 1948, M.D. 1953, University of Colorado

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M.D. 1943, Woman's Medical College of Pennsylvania
- Nelson Monroe Tart, *Assistant Clinical Professor of Obstetrics and Gynecology*
B.S. 1949, Wake Forest University; M.D. 1955, George Washington University
- Lovisa Jansen Tatnall, *Assistant Research Professor of Pediatrics (Child Development)*
M.D. 1937, Woman's Medical College of Pennsylvania; B.S. 1939, University of Washington
- Norman Taub, *Clinical Professor of Psychiatry*
B.S. 1937, M.D. 1941, University of Chicago
- Robert George Taylor, *Assistant Clinical Professor of Medicine*
B.S. 1933, Dickinson College; M.D. 1938, University of Pennsylvania
- Wilson Lewis Taylor, *Assistant Clinical Professor of Psychiatry (Experimental Psychology)*
B.A. 1930, Morningside College; M.A. 1937, University of Iowa; M.S. 1951, Tulane University of Louisiana; Ph.D. 1954, University of Illinois
- Ira Rockwood Telford, *Professor of Anatomy*
B.A. 1931, M.A. 1933, University of Utah; Ph.D. 1942, George Washington University
- Sarah Shtoffer Tenenblatt, *Assistant Clinical Professor of Psychiatry*
B.A. 1942, M.D. 1944, University of California, Berkeley
- James Richard Thistlethwaite, *Associate Clinical Professor of Surgery*
B.S. 1943, University of Richmond; M.D. 1947, Duke University
- Andree Raymonde Thomas, *Clinical Instructor in Medicine*
B.S., B.A. 1950, P.C.B. 1951, M.D. 1960, University of Paris, France
- Frances Bagwell Thomas, *Assistant Clinical Professor of Psychiatry (Social Work)*
B.A. 1961, M.S.W. 1963, University of North Carolina at Chapel Hill
- Lawrence Jay Thomas, *Associate Clinical Professor of Medicine*
B.S. 1934, New York University; M.D. 1938, George Washington University
- Martin Alfred Thomas, *Clinical Instructor in Radiology*
B.S. 1948, Purdue University; M.D. 1952, Indiana University
- Charles Waters Thompson, *Clinical Professor of Medicine*
M.D. 1941, George Washington University
- Earle Brosius Thompson, *Clinical Instructor in Medicine*
B.S. 1945, Franklin and Marshall College; M.D. 1945, University of Pennsylvania
- George John Thorpe, *Assistant Clinical Professor of Medicine*
B.A. 1956, M.D. 1960, Case Western Reserve University
- Howard Erwin Ticktin, *Associate Clinical Professor of Medicine*
B.A. 1950, M.D. 1954, George Washington University
- *Charles Stanley Tidball, *Henry D. Fry Professor of Physiology*
B.A. 1950, Wesleyan University; M.S. 1952, University of Rochester; Ph.D. 1955, University of Wisconsin; M.D. 1958, University of Chicago
- Mary Elizabeth Tidball, *Research Professor of Physiology*
B.A. 1951, Mount Holyoke College; M.S. 1955, Ph.D. 1959, University of Wisconsin
- George Tievsky, *Clinical Instructor in Radiology*
B.S. in Phar. 1939, M.D. 1943, George Washington University
- Donn Lloyd Tippet, *Assistant Clinical Professor of Psychiatry*
M.D. 1947, Ohio State University
- Elijah White Titus, Jr., *Clinical Instructor in Obstetrics and Gynecology*
M.D. 1952, George Washington University
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B.S. 1949, M.D. 1955, Howard University
- Charles Eby Townsend, *Clinical Instructor in Obstetrics and Gynecology*
B.A. 1948, M.D. 1951, George Washington University
- George Anthony Tralka, *Clinical Instructor in Medicine*
B.S. 1949, M.D. 1956, Georgetown University
- Carleton Raymond Treadwell, *Professor of Biochemistry*
B.A. 1934, Battle Creek College; M.S. 1935, Ph.D. 1939, University of Michigan
- Howard Pettit Treichler, *Assistant Clinical Professor of Obstetrics and Gynecology*
M.D. 1946, George Washington University
- William MacLohon Tribble, *Assistant Clinical Professor of Otolaryngology*
B.A. 1943, Princeton University; M.D. 1950, George Washington University; M.S. in Med. 1956, University of Pennsylvania
- Nelson Perez Trujillo, *Clinical Instructor in Medicine*
B.S. 1955, Baldor Academy, Cuba; M.D. 1962, Tulane University of Louisiana
- Neofytos Theodore Tsangaris, *Associate Professor of Surgery*
B.S. 1952, Duke University; M.D. 1956, George Washington University
- Mark On-Man Ts'o, *Assistant Clinical Professor of Ophthalmology*
M.B., B.Surg. 1961, University of Hong Kong
- William Patrick Tunell, *Instructor in Surgery*
B.S. 1955, University of Notre Dame; M.D. 1959, Cornell University
- Maria Lourdes Turner, *Clinical Instructor in Dermatology*
B.S. 1958, M.D. 1961, University of the Philippines
- Raymond William Turner, *Clinical Instructor in Medicine*
B.A. 1954, Amherst College; M.D. 1958, Yale University
- Herbert Andrew Urweider, *Assistant Clinical Professor of Ophthalmology*
B.A. 1954, Bowdoin College; M.D., C.M. 1958, McGill University, Canada
- George Vartkes Vahouny, *Professor of Biochemistry*
B.S. 1953, M.S. 1955, Ph.D. 1958, George Washington University
- Josef Karel Viktora, *Associate Research Professor of Medicine (Biochemistry)*
B.S. 1950, Ph.D. 1953, Charles University, Czechoslovakia
- William Roy Vineyard, *Assistant Clinical Professor of Dermatology*
M.D. 1950, Washington University
- John Vinyard, Jr., *Assistant Clinical Professor of Epidemiology and Environmental Health*
B.S. 1949, M.S. 1950, University of Missouri; M.P.H. 1953, University of California, Berkeley
- Brantley Paul Vitek, *Clinical Instructor in Orthopaedic Surgery*
B.A. 1957, Western Maryland College; M.D. 1961, University of Maryland
- Boris George Vlalukin, *Clinical Instructor in Medicine*
M.D. 1961, University of Belgrade, Yugoslavia
- James Wells Voell, *Clinical Instructor in Psychiatry*
M.D. 1959, Marquette University
- Ralph Weyman Wadson, Jr., *Assistant Clinical Professor of Psychiatry*
M.D. 1947, University of Alabama
- Robert Stephen Waldman, *Clinical Instructor in Medicine*
B.A. 1957, University of Pennsylvania; M.D. 1961, Georgetown University
- Francis Neil Waldrop, *Clinical Professor of Psychiatry*
B.A. 1946, University of Minnesota; M.D. 1950, George Washington University
- Glenn Walker, *Assistant Professor of Biochemistry*
B.A. 1958, Bellarmine-Ursuline College; Ph.D. 1963, Michigan State University

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B.S. 1949, Westminster College, Pennsylvania; M.D. 1953, Jefferson Medical College of Philadelphia
- James Christopher Walsh, *Assistant Clinical Professor of Obstetrics and Gynecology*
B.A. 1941, M.D. 1945, Georgetown University
- Donald Walters, *Associate Clinical Professor of Obstetrics and Gynecology*
B.S. 1939, M.D. 1943, University of Virginia
- Archibald Ward, Jr., *Assistant Clinical Professor of Psychiatry (Sociology)*
B.S. 1933, North Carolina State University at Raleigh; B.D. 1937, Crozer Theological Seminary; Ph.D. 1947, University of Maryland
- Robert Edward Ware, *Clinical Instructor in Urology*
M.D. 1953, Virginia Commonwealth University Medical College of Virginia
- Robert Orr Warthen, *Clinical Instructor in Pediatrics*
M.D. 1944, George Washington University
- John Augustine Washington, *Clinical Professor of Pediatrics*
B.A. 1924, Virginia Military Institute; B.S. 1926, University of Virginia; M.D. 1930, Johns Hopkins University
- Don Wayne Watkins, *Assistant Professor of Physiology*
B.Ch.E. 1963, University of Louisville; Ph.D. 1968, University of Wisconsin
- Joseph Hicks Watson, *Assistant Clinical Professor of Medicine*
B.S. 1940, University of Florida; M.D. 1943, Hahnemann Medical College
- Mary Falorsi Watt, *Associate Professor of Medicine*
M.D. 1950, Johns Hopkins University
- Benny Waxman, *Associate Professor of Obstetrics and Gynecology*
M.D. 1957, University of Western Ontario, Canada
- Blair McWhorter Webb, *Assistant Clinical Professor of Otolaryngology*
M.D. 1955, University of Virginia
- Charles Richard Webb, *Assistant Clinical Professor of Pediatrics*
B.S. 1943, Canisius College; M.D. 1946, Georgetown University
- Charles Malcolm Weber, *Clinical Instructor in Radiology*
M.D. 1951, Georgetown University
- William Farnsworth Weber, *Assistant Clinical Professor of Psychiatry*
M.D. 1962, Yale University
- George Davis Weickhardt, *Assistant Clinical Professor of Neurology*
M.D. 1939, George Washington University
- Anna Allman Weihrer, *Assistant Professor of Clinical Engineering*
B.A. 1948, M.S. 1949, West Virginia University
- Hans Weil-Malherbe, *Associate Clinical Professor of Psychiatry (Neurochemistry)*
M.D. 1929, University of Heidelberg, Germany; M.S. 1940, D.Sc. 1945, University of Durham, England
- John Russell Weimer, *Clinical Instructor in Ophthalmology*
B.S. 1946, University of Pittsburgh; M.D. 1948, Johns Hopkins University
- Morris Aaron Weinberger, *Assistant Clinical Professor of Pathology*
B.S. 1942, M.D. 1946, Tufts University
- Harold Weiner, *Clinical Professor of Psychiatry (Experimental Psychology)*
B.B.A. 1953, City College, New York; M.A. 1957, Ph.D. 1960, University of Maryland
- Jacob Joseph Weinstein, *Assistant Clinical Professor of Surgery*
Phar.G. 1930, B.S. 1934, M.D. 1936, University of Maryland
- Paul Stephen Weisberg, *Associate Clinical Professor of Psychiatry*
B.A. 1952, Harvard University; M.D. 1958, Marquette University
- Lowell Martin Weiss, *Clinical Instructor in Medicine*
B.S. 1957, Rutgers University; M.D. 1962, George Washington University
- Stephen Weissman, *Assistant Clinical Professor of Psychiatry*
B.A. 1959, Cornell University; M.D. 1963, Yeshiva University

- Isaac Weiszer, *Clinical Instructor in Medicine*
B.S. 1956, M.D. 1960, University of Illinois
- Don Wenger, *Associate Professor of Surgery*
B.A. 1934, University of Wisconsin; M.D. 1937, Marquette University; M.S. 1956, Georgetown University; J.D. 1962, George Washington University
- Stanley Gerald Werner, *Instructor in Pediatrics*
B.S. 1948, Stanford University; B.A. 1950, M.D. 1952, University of Illinois
- Milton William Werthmann, Jr., *Assistant Professor of Pediatrics*
B.S. 1958, M.D. 1962, Georgetown University
- David Colwell Wherry, *Associate Clinical Professor of Surgery; Associate University Surgeon*
B.A. 1949, M.D. 1952, George Washington University
- George Erhardt White, *Clinical Instructor in Surgery*
B.A. 1954, M.D. 1957, George Washington University
- John Raymond Whiteman, *Research Instructor in Medicine*
M.D. 1967, George Washington University
- William Whitmore, Jr., *Assistant Clinical Professor of Medicine*
M.D. 1948, Virginia Commonwealth University Medical College of Virginia
- Henry Sindos Wicker, *Assistant Clinical Professor of Ophthalmology*
B.S. 1948, Xavier University, Louisiana; M.D. 1953, Howard University
- Uthai Vincent Wilcox II, *Clinical Instructor in Radiology*
M.D. 1939, George Washington University
- Richard Wallace Wilkinson, *Associate Clinical Professor of Ophthalmology*
B.A. 1925, M.D. 1928, George Washington University; M.S. in Med. 1932, University of Pennsylvania
- Robert Shaw Wilkinson, *Assistant Clinical Professor of Medicine*
B.A. 1950, Dartmouth College; M.D. 1955, New York University
- Jonathan Marshall Williams, *Clinical Professor of Neurological Surgery*
M.D. 1938, University of Chicago
- Kenneth DeLee Williams, *Instructor in Clinical Engineering*
B.S. 1951, University of Richmond; M.S. 1956, University of Virginia; M.S. 1962, Johns Hopkins University
- Marjorie Joan Williams, *Assistant Clinical Professor of Pathology*
M.D. 1943, University of Bristol, England
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- Thomas Ashton Wilson, *Assistant Clinical Professor of Obstetrics and Gynecology*
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- David Erwin Winer, *Assistant Professor of Clinical Engineering*
B.E. 1956, Vanderbilt University; LL.B. 1965, George Washington University
- Alan William Winshel, *Assistant Clinical Professor of Obstetrics and Gynecology*
B.A. 1948, Temple University; M.D. 1952, Hahnemann Medical College
- Theodore Winship, *Associate Clinical Professor of Pathology*
B.A. 1931, M.D. 1937, University of Nebraska
- Karl Wipplinger, *Assistant Professor of Medicine*
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- Philip Witorsch, *Assistant Professor of Medicine*
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- Stanley Irving Wolf, *Associate Clinical Professor of Pediatrics*
B.S. 1947, M.D. 1948, Georgetown University

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B.A. 1957, M.D. 1961, Cornell University; D.C.M.T. 1967, London School of Hygiene and Tropical Medicine, England
- Frederick William Wolff, *Professor of Medicine*
M.B., B.S. 1946, M.D. 1957, Durham University, England
- Herbert DeGrange Wolff, Jr., *Clinical Instructor in Urology*
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- Michael Aime Woodbury, *Assistant Clinical Professor of Psychiatry*
Ph.B. 1942, University of Paris, France; B.A. 1945, M.D. 1951, Harvard University
- Paul Oswald Woolley, Jr., *Assistant Professorial Lecturer in Medicine*
B.A. 1960, Cornell University; M.D. 1964, Yale University; M.P.H. 1968, University of California, Berkeley
- George Leonard Wright, Jr., *Assistant Professor of Microbiology*
B.A. 1959, Albion College; M.S. 1962, Ph.D. 1966, Michigan State University
- Thomas Mahlon Wright, *Assistant Clinical Professor of Surgery*
B.A. 1946, Washington and Lee University; M.D. 1951, University of Virginia
- Alvin Charles Wyman, *Associate Clinical Professor of Radiology*
B.A. 1939, Cornell University; M.D. 1943, New York University
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B.A. 1947, M.D. 1951, American University of Beirut, Lebanon
- Hoyoko Migaki Yahanda, *Instructor in Medicine*
B.S. 1946, M.S. 1949, Washington State University; M.D. 1954, University of Oregon
- Harold Taylor Yates, *Assistant Clinical Professor of Pediatrics*
M.D. 1941, University of Virginia
- Leon Yochelson, *Professor of Psychiatry*
B.A. 1938, M.D. 1942, State University of New York at Buffalo
- Samuel Yochelson, *Clinical Professor of Psychiatry (Criminal Behavior)*
B.S. 1926, M.A. 1927, State University of New York at Buffalo; Ph.D. 1930, M.D. 1936, Yale University
- Stanley Yolles, *Clinical Professor of Psychiatry*
B.A. 1939, Brooklyn College; M.A. 1940, Harvard University; M.D. 1950, New York University; M.P.H. 1957, Johns Hopkins University
- Delosa Anthony Young, *Clinical Instructor in Pediatrics*
B.A. 1959, Loyola University, Louisiana; M.D. 1962, Louisiana State University
- Ira Sanders Young, *Clinical Instructor in Urology*
B.A. 1955, Lafayette College; M.D. 1959, George Washington University
- William Hurlburt Young, Jr., *Assistant Clinical Professor of Psychiatry*
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- Richard Manuel Zakheim, *Clinical Instructor in Pediatrics*
B.A. 1958, Columbia University; M.D. 1962, Yeshiva University
- Bernard Harold Zeavin, *Assistant Clinical Professor of Ophthalmology*
M.D. 1950, University of Manitoba, Canada
- Ernest Michael Zimmerman, *Clinical Instructor in Ophthalmology*
M.D. 1963, University of Toronto, Canada
- Hyman Joseph Zimmerman, *Special Lecturer in Physiology*
B.A. 1936, University of Rochester; M.A. 1938, M.D. 1942, Stanford University
- Lorenz Eugene Zimmerman, *Clinical Professor of Pathology (Ophthalmic)*
B.A. 1943, M.D. 1945, George Washington University
- Mervin Harvey Zimmerman, *Clinical Instructor in Ophthalmology*
M.D. 1959, University of Toronto, Canada
- Bernard Charles Zook, *Assistant Professor of Pathology (Comparative)*
B.S. 1962, D.V.M. 1963, Colorado State University

William John Zukel, *Associate Clinical Professor of Epidemiology and Environmental Health*

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Assistants in Research and Instruction 1970-71

Edward Gerald Abramson, *Assistant in Urology*

B.A. 1962, University of Pennsylvania; M.D. 1967, University of Virginia

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B.S. 1962, Fairleigh Dickinson University; M.D. 1966, St. Louis University

James David Alford, *Assistant in Surgery*

B.A. 1959, M.D. 1966, University of North Carolina at Chapel Hill

Richard Gene Ammerman, *Assistant in Psychiatry*

B.A. 1964, Yale University; M.D. 1968, Tufts University

Constance Adams Anton, *Assistant in Psychiatry*

B.A., M.D. 1969, Boston University

Jerold Aronson, *Assistant in Psychiatry*

B.A. 1961, M.D. 1965, Case Western Reserve University

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B.S. 1961, University of Notre Dame; M.D. 1965, Indiana University

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M.D. 1961, Medical School of Lyons, France

Tali Bashour, *Assistant in Medicine (Cardiology)*

M.D. 1966, Damascus University, Syrian Arab Republic

Peter Barney Berendsen, *Fellow in Anatomy*

B.S. 1960, St. Mary's College of California; M.S. 1965, George Washington University

Harvey Robert Birschbach, *Fellow in Medicine (Gastroenterology)*

B.S. 1959, M.D. 1963, Marquette University

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B.A. 1964, LaSalle College; M.D. 1969, George Washington University

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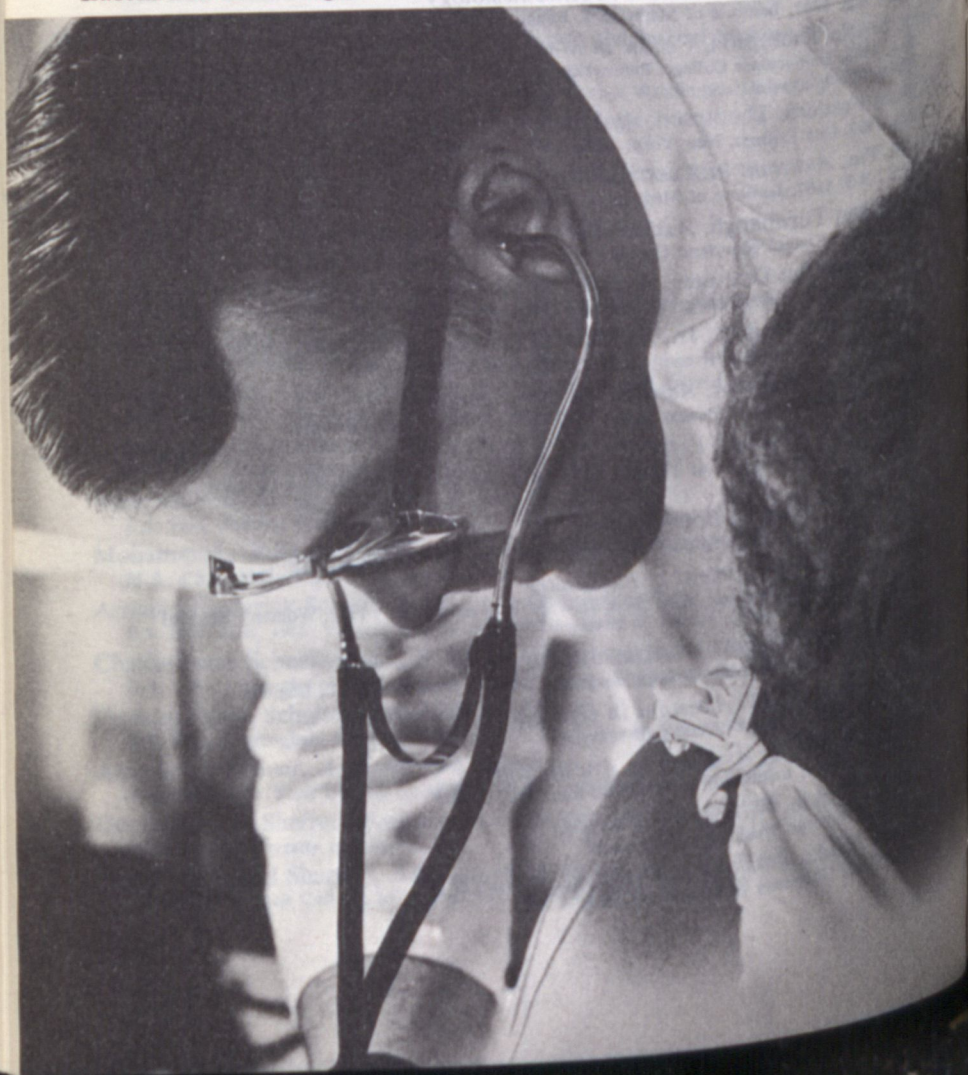
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THE SCHOOL OF MEDICINE RECORD 1970-71

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Amick, Roger B.B.A. 1970, Marshall University	W.Va.	Domont, Lawrence A. B.A. 1970, University of Pennsylvania	Ind.
Bacon, John R. B.S. 1970, George Washington University	Md.	Donahue, George M. B.S. 1964, Fairfield University	Conn.
Bacon, Robert J. B.A. 1970, Stanford University	Texas	Donovan, Joseph W. B.A. 1969, Manhattan College	N.Y.
Ball, John T. B.A. 1970, University of Virginia	Calif.	Downing, Terence P. B.A. 1970, University of Washington	Wash.
Balsley, Ellen J. B.A. 1967, Indiana University	Va.	Eisner, Martin E. B.A. 1970, University of Wisconsin	N.Y.
Bane, Susan H. B.A. 1968, George Washington University	Md.	Engleberg, Niels C. B.S. 1970, George Washington University	Md.
Barr, John L., III B.A. 1966, Harvard University	Md.	Falkowski, Walter S. B.S. 1967, St. Peter's College, N.J.	N.J.
Basen, Walter B. B.S. 1970, University of Maryland	Md.	M.A. 1969, Princeton University	
Baska, John K. B.A. 1970, George Washington University	Calif.	Finn, Peter V. B.A. 1970, University of Massachusetts	Mass.
Berlin, Gregory S. B.A. 1970, University of Washington	Wash.	Freer, Everett C., Jr. B.A. 1969, California Western University	Nev.
Billing, Paul M. B.A. 1970, Whitman College	Calif.	Furlow, Terrance G. Attended George Washington University	Md.
Blumberg, Andrew M. B.S. 1970, University of Wisconsin	N.J.	Gale, John H. B.A. 1970, Duke University	D.C.
Boyd, James C. Attended University of Maryland	Md.	Gardner, Melinda M. B.A. 1965, Duke University	D.C.
Burgess, Scott E. B.A. 1970, George Washington University	N.Y.	Giorno, Ralph C. B.A. 1970, University of Colorado	Colo.
Burtoff, Bruce D. B.A. 1970, University of Pennsylvania	D.C.	Glenn, Teri L. B.A. 1970, University of California, Berkeley	Calif.
Callahan, Michael E. B.S. 1970, Brigham Young University	Utah	Gloster, Robert C. B.S. 1970, Georgetown University	Mass.
Camp, Gregory V. B.S. 1968, University of Oregon	Ore.	Gluck, Rita K. B.A. 1968, New York University	Va.
Carmen, John C. B.S. 1970, University of Wyoming	Wyo.	Goldblatt, Robert S. B.A. 1970, George Washington University	N.Y.
Chaffee, Charles T. B.A. 1970, University of Washington	Wash.	Goldman, Steven L. B.S. 1970, George Washington University	Mass.
Clark, Thomas H. B.S. 1970, George Washington University	Va.	Gorin, Michael E. B.A. 1970, Northwestern University	D.C.
Cornelius, Douglas H. Attended University of Colorado	Colo.	Greenberg, Allen L. B.A. 1970, Franklin and Marshall College	N.Y.
Cresswell, George F. Attended Washington and Lee University	Md.	Greene, Michael A. B.S. in E.E. 1964, State University of New York at Buffalo	D.C.

Greenfield, Paul S.	N.J.	Nguyen, Levan	N.C.
B.A. 1970, University of Pennsylvania		B.S. 1970, Methodist College	Calif.
Hall, Frank A.	Ala.	Noguchi, Philip D.	N.J.
B.A. 1970, Emory University		B.A. 1970, University of California, Berkeley	
Hardy, William R.	Calif.	Pagano, Samuel W.	N.J.
B.A. 1970, University of California, Riverside		B.A. 1970, Johns Hopkins University	
Hartz, Leo M.	Pa.	Passeri, Ronald L.	N.Y.
B.A. 1969, Pennsylvania State University		B.A. 1970, Rutgers University	
Henriksen, Gary L.	Wash.	Payes, William C.	Pa.
B.S. in Phar. 1970, University of Washington		B.S. 1970, Syracuse University	
Heron, Howard C., II	Md.	Piccario, Joyce E.	Md.
B.A. 1970, George Washington University		B.A. 1970, Hood College	
Hirsch, Florie	N.Y.	Pooler, Robert W.	Ohio
B.A. 1970, Barnard College		B.S. 1970, Dickinson College	
Hobbs, Charles L., III	Del.	Principi, Kathy L.	D.C.
B.A. 1969, Yale University		B.A. 1970, Rutgers University	
Howard, Douglas R.	Mass.	Rabinowitz, Asher D.	Md.
B.S. 1970, Brown University		B.A. 1970, Yeshiva University	
Hsia, David Y.	Canada	Radice, Peter A.	Wash.
B.A. 1970, Johns Hopkins University		B.A. 1970, Yale University	
Isaacson, Paul J.	Md.	Rogge, Janet L.	N.Y.
B.A. 1970, Johns Hopkins University		B.A. 1970, University of Washington	
Jenkins, Roger C., Jr.	Calif.	Ross, Gary S.	D.C.
B.S. 1970, University of Washington		B.A. 1970, Colgate University	
Kalu, Uduma O.	Nigeria	Ruby, Jo-Anne B.	N.Y.
B.S. 1967, Iowa State University of Science and Technology		B.S. 1967, M.S. 1970, George Washington University	
M.S. 1969, Howard University		Sacks, Maury E.	N.Y.
Kaplan, Jack O.	N.Y.	B.A. 1970, Lehigh University	
B.S. 1970, George Washington University		Sarafan, Peter M.	Wash.
Kass, Frederic H., III	N.J.	B.A. 1970, Amherst College	
B.A. 1970, Colgate University		Sexton, Robert L.	Md.
Kelly, Gregory B.	Conn.	B.S. 1970, Gonzaga University	
B.S. 1970, University of Maryland		Smith, Alan W.	Fla.
Kennedy, James J.	Md.	B.S. 1970, Carson-Newman College	
B.A. 1969, Duke University		Smith, Kenneth R.	Canada
Kerr, Vicky E.	S.C.	Attended Florida Atlantic University	
B.A. 1970, Boston University		Soper, Warren Y., Jr.	N.Y.
Kestenbaum, David J.	N.Y.	B.A. 1970, Sir George Williams University, Canada	
B.A. 1970, Hofstra University		Starke, Peter R.	Md.
Kirchner, Nancy A.	Ind.	B.A. 1970, Trinity College, Conn.	
B.S. 1968, University of Maryland		Sternburg, Jon K.	D.C.
Kutcher, Leslie M.	N.Y.	B.A. 1970, Bowdoin College	
B.S. 1970, Brooklyn College		Stewart, Richard C.	Utah
Laney, Steven R.	Wash.	B.A. 1964, University of Pennsylvania	
B.S. 1970, University of Washington		Taylor, Paul R.	Ark.
Lau, Mark M.	Calif.	B.A. 1970, Weber State College	
B.A. 1970, University of California, Berkeley		Thomas, Katherine L.	Tenn.
Lieberman, Jeffrey A.	Ohio	Attended University of Arkansas	
B.A. 1970, Miami University		Thompson, John M.	Utah
London, David B.	Nev.	B.S. 1970, Florida Southern University	
B.A. 1970, George Washington University		Thomson, John W.	Md.
Ludlow, Paul C.	Calif.	B.S. 1970, Brigham Young University	
B.S. 1970, Brigham Young University		Tievsky, Andrew L.	D.C.
Maher, Stephen C.	Wash.	B.A. 1970, University of Rochester	
B.S. 1970, University of Notre Dame		Trued, Sally J.	Del.
Manart, Frank D.	Calif.	B.A. 1970, Northwestern University	
B.A. 1969, University of Southern California		Valk, Thomas H.	Ohio
Mangiaracina, Thomas A.	N.Y.	B.S. 1969, Harvey Mudd College	
B.A. 1970, New York University		Van Atta, Glen B., Jr.	Pa.
Marks, William A.	N.Y.	B.A. 1965, Ohio Northern University	
B.A. 1969, St. Lawrence University		Van Brakle, John D.	Ohio
McCormick, Joseph P.	N.Y.	B.S. 1970, Muhlenberg College	
B.A. 1969, Alfred University		Vangrov, Mark S.	Md.
McIntyre, Robert C.	Wash.	B.A. 1970, Miami University	
B.S. 1969, Washington State University		Van Osdel, Lewis A., III	D.C.
Miller, Robert E.	N.Y.	B.A. 1968, University of Washington	
B.A. 1970, Hofstra University		Werner, Christopher S.	R.I.
Murray, Ives P.	N.Y.	B.A. 1969, Dickinson College	
B.A. 1969, University of Colorado		Whitfield, Peter W.	
Newman, Robert E.	Md.	B.A. 1969, University of Rhode Island	
B.A. 1970, Lafayette College			

Wisotsky, Philip	Md.	Zagorski, Joseph B.	N.J.
B.A. 1970, Boston University		B.A. 1969, University of Pennsylvania	
Yimoyines, Dean J.	Conn.		
B.A. 1969, Syracuse University			

SECOND YEAR

Adams, Elizabeth G.	Mass.	Funt, Loren S.	Fla.
B.A. 1966, Wellesley College		Attended George Washington University	
Adkins, James W.	Conn.	Gersh, Elliot S.	Ohio
B.A. 1969, Wesleyan University		B.S. 1969, Ohio State University	
Bader, Robert F.	Calif.	Gladstein, Geoffrey S.	Conn.
B.A. 1969, University of California, Los Angeles		B.A. 1969, University of Connecticut	
Banis, Joseph C.	Calif.	Goldklang, Gerald A.	N.J.
B.S. 1969, Loyola University of Los Angeles		B.A. 1969, Boston University	
Barbiere, Charles F.	N.Y.	Gray, William C.	Md.
B.A. 1969, New York University		B.S. 1969, University of Maryland	
Bass, Bernard N.	Mass.	Hanowell, Ernest D.	Calif.
B.A. 1969, George Washington University		B.S. 1969, University of California, Davis	
Bentley, Wendell J.	Utah	Harris, Jeffrey D.	N.Y.
B.S. 1970, University of Utah		B.A. 1968, Hofstra University	
Bishop, Norman R.	Md.	Hauptman, Alexander O.	N.J.
B.S. 1969, George Washington University		B.A. 1967, American University	
Bobrow, Nathan M.	Md.	Heller, Joel H.	N.J.
Attended George Washington University		B.S., B.Pharm. 1968, Rutgers University	
Bogran, Luis	Honduras	Hsieh, Robert C.	D.C.
B.S. 1968, George Washington University		B.S. 1969, George Washington University	
Bollinger, Bruce C.	Colo.	Hunter, Bruce C.	Utah
B.S. 1969, George Washington University		B.S. 1969, Weber State College	
Boxall, David W.	Wis.	Isaacs, Steven E.	N.Y.
B.Arch. 1968, Carnegie-Mellon University		B.S. 1967, St. Lawrence University	
Boyd, Richard B.	Mass.	Javerbaum, Jeffrey S.	N.J.
Attended Boston University		B.A. 1969, Cornell University	
Brantner, Brian D.	Calif.	Johnson, Mark Y.	Wash.
B.A. 1968, California Lutheran College		B.S. 1969, University of Washington	
Broughton, Warren L.	Md.	Kaires, Pamela A.	N.Y.
B.A. 1970, George Washington University		B.S. 1969, State University of New York	
Burstein, Darrell H.	Conn.	at Stony Brook	
B.S. 1969, Trinity College, Conn.		Kanda, Mireille B.	Haiti
Callihan, Thomas R.	Ohio	B.S. 1969, American University	
B.A. 1969, Kenyon College		Kerns, Scott E.	Mich.
Ceder, Lenart C.	Wash.	B.S. 1969, University of Michigan	
B.A. 1969, University of Washington		Kohl, Cheryl A.	N.J.
Chase, William D., Jr.	Mich.	B.A. 1969, Duke University	
B.S. 1969, University of Michigan		Kolb, Garry R.	Calif.
Coit, Alan S.	Texas	B.S. 1968, California State Polytechnic	
B.A. 1969, Colby College		College, San Luis Obispo	
Cooper, Wayne D.	N.J.	Krakovitz, Robert W.	Pa.
B.A. 1969, Alfred University		B.A. 1969, Pennsylvania State University	
Cresswell, Dianne	Md.	Kuhn, Kerry L.	N.Y.
B.A. 1968, Muskingum College		B.A. 1970, George Washington University	
Cricco, Robert P.	N.J.	Leeper, Willard S.	Calif.
B.S. 1969, Fairfield University		B.S. 1970, Brigham Young University	
Crock, Thomas R.	Pa.	Levin, Ronald H.	Conn.
B.A. 1969, Johns Hopkins University		B.A. 1969, Clark University	
Curlman, David R.	Ohio	Lewin, Alan A.	N.J.
B.A. 1965, Columbia Union College		B.A. 1969, Temple University	
M.S. 1967, George Washington University		Lewis, Allan J.	Ariz.
Defranzo, Anthony J.	Conn.	B.B.A. 1949, Texas Tech University	
B.S. 1969, Trinity College, Conn.		Lewis, David G.	Utah
Earls, Stephen T.	Mass.	B.S. 1969, University of Utah	
B.A. 1970, George Washington University		Lipsett, Nathan W.	N.J.
Ehrlich, Dion R.	N.Y.	B.A. 1969, Kenyon College	
B.A. 1969, Franklin and Marshall College		Liverett, David M.	Md.
Feller, Patricia A.	N.J.	B.A. 1969, University of Virginia	
B.A. 1969, Rutgers University		Luria, Alan S.	Fla.
Fiaschetti, Frank L.	N.Y.	B.A. 1969, University of Michigan	
B.S. 1969, Muhlenberg College		Mangan, Kenneth F.	Mass.
Frist, Brian S.	N.Y.	B.S. 1969, University of Massachusetts	
B.S. 1969, American University			

Manley, Michael D. B.A. 1967, M.A. 1970, Sacramento State College	Calif.	Spero, Charles R. B.S. 1969, Columbia University	N.Y.
Margules, Edward R. B.A. 1968, University of California, Los Angeles	Calif.	Stang, Howard D. B.A. 1969, Rutgers University	N.J.
Mugmon, Marc A. Attended Georgetown University	Md.	Stewart, Barry C. B.A. in B.A. 1962, University of Washington	Wash.
Mulé, Salvatore B.A. 1969, University of Connecticut	Conn.	Sullivan, Timothy P. B.S. 1969, St. Peter's College, N.J.	N.J.
Myles, Courtland L. B.S. 1968, American University	D.C.	Sutton, Frederick J. B.A. 1969, Cornell University	Md.
Partlow, Kenneth L. Attended University of Washington	Wash.	Sveda, Sally A. B.A. 1965, Smith College	Conn.
Paszek, Michael J. B.S. 1969, Trinity College, Conn.	Conn.	Sweet, Ronald C. B.S. 1969, Wright State University	Ohio
Pechan, B. Warren B.A. 1969, Cornell University	N.Y.	Tamagna, Ellen I. B.A. 1969, Goucher College	Md.
Penhos, Juan C. B.A. 1970, George Washington University	Argentina	Thistlethwaite, Susan J. B.A. 1969, Lycoming College	Pa.
Peters, John R. B.A. 1969, New York University	N.Y.	Thomas, Thomas, Jr. B.A. 1967, M.S. 1969, Pennsylvania State University	Md.
Powell, Richard M. B.A. 1968, Temple University	Pa.	Travers, Charles K., Jr. B.S. 1969, University of Maryland	Calif.
Prioleau, George R., Jr. B.S. 1969, South Carolina State College	S.C.	Tvedt, Robert A. B.A. 1969, Stanford University	Mass.
Ripley, Robert C. B.A. 1968, University of California, Berkeley	Calif.	Uman, Howard M. B.A. 1969, Amherst College	Fla.
Romano, John F. B.S. 1969, St. Peter's College, N.J.	N.Y.	Van de Water, Donald T. B.S. 1969, George Washington University	Pa.
Rosenthal, Jesse S. B.A. 1969, George Washington University	N.Y.	Van der Werf, Joseph N. B.A. 1969, Duke University	Wash.
Ross, Stuart E. B.A. 1969, University of Pennsylvania	D.C.	Van Meter, Keith B.A. 1963, Miami University	Mexico
Rumsey, Eugene W. B.A. 1969, San Diego State College	Calif.	Villarreal, Fernando A. B.A. 1970, George Washington University	Md.
Saffer, Jeffrey M. B.A. 1969, Dartmouth College	N.J.	Webb, David W. B.S. 1969, University of Maryland	Wis.
Scalettar, Robert E. B.A. 1969, University of Wisconsin	N.Y.	Wex, Timothy G. B.A. 1969, Johns Hopkins University	N.J.
Schade, Robert R. B.A. 1969, Colgate University	N.Y.	Wilkenfeld, Morris B.A. 1969, Lafayette College	Ohio
Schlifftman, Ronald C. B.A. 1969, George Washington University	N.Y.	Wilson, Douglas D. B.S. 1969, Wright State University	Calif.
Siemers, Paul T. B.S. 1968, University of Illinois	Ill.	Wilson, Stephen C. B.S. 1969, University of Southern California	Conn.
Silverman, Eugene D. B.A. 1970, George Washington University	D.C.	Wright, Kenneth J. B.S. 1969, Trinity College, Conn.	Pa.
Smith, Lois F. B.S. 1969, Dickinson College	Va.	Yates, Anthony P. B.A. 1969, St. Vincent College, Pa.	Md.
Smolansky, Stephen J. B.A. 1969, Temple University	N.Y.	Yingling, Kae S. B.S. 1969, University of Maryland	N.Y.
Soben, Arthur L. B.A. 1969, Rutgers University	N.J.	Zarchy, Thomas M. B.S. 1969, Trinity College, Conn.	
Sokol, Scott K. B.A. 1969, Syracuse University	N.Y.		

THIRD YEAR

Adams, Anthony W. B.S. 1968, Virginia Polytechnic Institute	Va.	Apter, Matthew N. B.S. 1968, Trinity College, Conn.	Conn.
Alarcon, Pedro A. De B.A. 1968, Harvard University	Guatemala	Apter, Roy J. B.A. 1968, University of Wisconsin	Wis.
Althoff, Rodger W. B.A. 1968, Kent State University	Ohio	Barnard, Margaret E. B.S. 1967, Dalhousie University, Canada	Canada
Ammerman, Bruce J. B.S. 1969, Case Western Reserve University	Md.	Beall, Michael E. B.A. 1968, Ohio Wesleyan University	N.D.
Annos, Thomas B.A. 1968, University of Pennsylvania	Del.	Becker, Stuart A. B.A. 1968, Lafayette College	N.J.

Johnson, Steele R. B.A. 1966, University of Washington	Wash.	Bergman, Stuart K. B.A. 1968, University of Virginia	N.J.
Joseph, Raymond E. B.S. 1968, Ohio State University	Ohio	Binder, Marc K. B.S. 1969, Pennsylvania State University	Pa.
Juel, Randolph W. B.A. 1968, University of Washington	Wash.	Bis, Kathleen A. B.S. 1968, George Washington University	N.J.
Kassan, Stuart S. B.A. 1968, Case Western Reserve University	N.Y.	Blonar, Robert A. B.S. 1968, George Washington University	Md.
Katlan, Roberta L. B.S. 1968, Simmons College	N.Y.	Bondell, Steven P. B.S. 1968, City College, New York	N.Y.
Katz, Jeffrey I. B.A. 1968, Clark University	N.Y.	Brancaccio, Ronald R. B.S. 1968, Fairfield University	N.Y.
Katzen, Jay E. B.A. 1967, George Washington University	D.C.	Bransfield, Robert C. B.A. 1968, Rutgers University	N.J.
Kaufman, Joseph H. B.A. 1963, New York University	N.Y.	Briggs, Charles M. B.A. 1965, University of Pennsylvania	Va.
Kessler, Michael A. B.A. 1968, Rutgers University	N.J.	Campbell, Darrell A., Jr. B.S. 1968, Michigan State University	Mich.
Kiessling, Brenda R. B.A. 1962, Oberlin College	Va.	Cerruti, Michael A. B.A. 1966, University of California, Berkeley	Calif.
M.A. in Ed. 1964, George Washington University		Chapin, Donald C. B.A. 1968, Tufts University	Md.
Kimball, Richard R. B.A. 1967, University of California, Riverside	Calif.	Cockerham, Elaine L. B.A. 1967, Valparaiso University	Mo.
King, Don R. B.S. 1968, University of Redlands	Calif.	Cowin, John A. B.A. 1968, Gettysburg College	N.Y.
King, Joy D. B.S. 1968, University of Washington	Wash.	Craft, J. Carl B.A. 1968, California Western University	Utah
Kirby, Richard L. B.A. 1968, University of Delaware	Del.	Daines, Stephen P. Attended Utah State University of Agriculture and Applied Science	Utah
Knudson, Homer E. B.S. 1968, Brigham Young University	Va.	Daly, Joseph T. B.A. 1967, University of California, Davis	Calif.
Korengold, George M. B.A. 1968, University of Pennsylvania	Md.	Davis, Christopher J. B.S. 1968, Massachusetts Institute of Technology	Calif.
Kravitz, Paul H. B.S. 1968, George Washington University	N.Y.	De Figuerredo, Paul D. B.S. 1966, Stanford University	Portugal
Krzyzkowski, Michael J. B.S. 1968, Wagner College	N.J.	Diaz, Carlos R. B.A. 1968, Johns Hopkins University	Md.
Leventhal, Stuart P. B.S. 1968, University of Pittsburgh	N.J.	Donaldson, Mary M. B.A. 1968, Sweet Briar College	Md.
Lichtenstein, Alan K. B.A. 1968, Brooklyn College	N.Y.	Donohue, Dennis J. B.S. 1966, St. John's University, N.Y.	Md.
Lichtenstein, Jacqueline W. B.A. 1967, Antioch College	Md.	Ehrlich, Leonard D. B.A. 1968, Hunter College	N.Y.
Loube, Julian M. B.A. 1967, George Washington University	Md.	Eisenbaum, Allan M. B.A. 1969, George Washington University	N.Y.
Macht, Steven D. B.S. 1965, D.D.S. 1969, University of Maryland	Md.	Elam, Kenneth C. B.S. 1968, Muhlenberg College	N.J.
Magee, William P., Jr. D.D.S. 1969, University of Maryland	N.J.	Exner, John H. B.S. 1968, College of Idaho	Idaho
Marion, Edward D. B.A. 1969, George Washington University	N.Y.	Fine, Anne Elizabeth H. B.A. 1969, George Washington University	Calif.
McCarthy, Patrick J. B.A. 1968, LaSalle College	Md.	Fox, Sherman S. B.A. 1968, Johns Hopkins University	N.J.
McClenathan, James H. Attended Carnegie-Mellon University	Md.	Franklin, John M. B.S. 1968, University of Washington	Wash.
Miyawaki, Edison H. M.S. 1964, Johns Hopkins University	Hawaii	Georges, Britton L. B.S. 1968, University of Washington	Wash.
Monteverde, Ronald P. B.S. 1968, St. Peter's College, N.J.	N.Y.	Giannuzzi, Vito A. B.S. 1968, George Washington University	N.Y.
Mowery, James H. B.A. 1968, Northwestern University	Ill.	Goldman, Robert L. B.A. 1968, University of Pennsylvania	D.C.
Nickens, Wayne C. B.S. 1968, Howard University	D.C.	Griffiths, Richard C. B.S. 1968, Michigan State University	Va.
Nierman, Robert S. B.A. 1968, Boston University	Mass.	Helgott, Maxwell A. B.A. 1968, Grinnell College	Md.
Noble, Donald E. B.A. 1968, George Washington University	Md.	Hunter, Robert J. B.A. 1968, Franklin and Marshall College	Pa.

150 SCHOOL OF MEDICINE

Olds, Corwin A.	Calif.	Seltzer, Shalom D.	D.C.
B.S. 1947, U.S. Naval Academy		Attended Tulane University of Louisiana	
B.S. in M.E. 1955, M.S. in M.E. 1956, U.S. Naval Postgraduate School		Shreeve, Thomas L.	Md.
Oliff, Michael	N.J.	B.A. 1968, Franklin and Marshall College	Conn.
B.A. 1968, Rutgers University		Sklaver, Allen R.	Pa.
Orman, Ronald J.	Mont.	B.A. 1968, Williams College	
Attended University of Montana		Snover, Seth W.	Iowa
Parker, Frederick W., III	Pa.	B.S. 1968, Muhlenberg College	
B.S. 1968, University of Scranton		Sonkens, Jerry W.	N.J.
Paul, David A.	Md.	B.S. 1967, Brigham Young University	
B.A. 1968, Rutgers University		Street, Thomas F.	D.C.
Pearson, Michael L.	Wash.	B.S. 1968, John Carroll University	
B.S. 1968, Washington State University		Surrey, Mark W.	Utah
Peck, Dennis F.	Wash.	B.S. 1968, University of Pittsburgh	
B.A. 1968, University of Washington		Swensen, Laird S.	Haiti
Pillsbury, Harold C., III	Md.	B.A. 1968, Brigham Young University	
Attended George Washington University		Theard, Franz C.	Wash.
Powell, Thomas R.	N.Y.	B.A. 1968, Catholic University of America	
B.A. 1968, Boston University		Thompson, Charles E., Jr.	Utah
Reff, Richard B.	Md.	B.A. 1968, University of Washington	
B.A. 1969, George Washington University		Thomson, Stephen T.	D.C.
Rotstein, Martha	Mass.	B.S. 1968, Brigham Young University	
B.S. 1968, Simmons College		Thornton, Abigail G.	
Schenk, Joseph H.	Md.	B.S. 1965, M.S. 1967, George Washington University	Mass.
B.A. 1968, LaSalle College		Warchol, Richard J.	N.Y.
Scherf, Chrisman G.	N.Y.	B.A. 1967, Millikin University	
B.S. 1968, Duke University		Winston, David H.	Colo.
Schulz, Robert W.	Fla.	B.A. 1968, State University of New York at Binghamton	
Attended George Washington University		Zimmerman, Larry G.	
Schweitz, Michael C.	Md.	B.S. 1968, Colorado State University	
B.A. 1969, George Washington University			

FOURTH YEAR

Abbott, Richard L.	N.Y.	Charlton, Brian L.	Md.
B.S. 1967, Tufts University		B.A. 1967, Western Maryland College	
Adam, George	N.Y.	Chrisman, Allan K.	Md.
B.A. 1967, New York University		B.A. 1967, Lafayette College	
Aldrich, Stephen M.	Wash.	Clark, John L.	N.Y.
B.A. 1967, Whitman College		B.A. 1967, Franklin and Marshall College	
Allen, Robert J.	Utah	Cleary, John B.	Va.
B.S. 1967, Brigham Young University		B.S. 1967, Niagara University	
Allgaier, Wayne	Va.	Cleveland, Marcia C.	Conn.
B.S. 1967, Brigham Young University		B.S. 1967, Parsons College	
Babcock, Terence L.	Md.	Corr, Charles A.	N.J.
B.S. 1967, George Washington University		B.A. 1967, Wesleyan University	
Barnes, Patricia J.	N.J.	Costa, Jack M.	N.Y.
B.A. 1966, Gettysburg College		B.A. 1967, Gettysburg College	
Bikowski, Joseph B., Jr.	Md.	Crawford, Joseph A.	
B.A. 1967, LaSalle College		B.S. in E.E. 1960, Case Western Reserve University	Va.
Boyd, William D., II	Md.	M.S. in E.E. 1964, Columbia University	
B.S. 1967, University of Maryland		Crossland, Stanley G.	N.Y.
Brancaccio, Michael	N.Y.	B.S. 1967, University of Richmond	
B.S. 1967, Fairfield University		Dantzig, Paul I.	N.J.
Brener, George A.	Mass.	Attended Rensselaer Polytechnic Institute	
B.A. 1967, Boston University		Darr, David L.	N.Y.
Browne, Allen F.	Calif.	B.S. 1967, Muhlenberg College	
B.A. 1967, Brown University		Delmonico, Francis L.	Ariz.
Browne, Madonna E.	Maine	B.S. 1966, Mount St. Mary's College	
B.S. 1964, Duke University		Dicus, Paul E.	Md.
Brunt, Roger S.	Idaho	Attended University of Arizona	
B.S. 1967, Brigham Young University		Fine, Paul M.	N.Y.
Bush, Frank J.	Mass.	B.A. 1968, George Washington University	
B.A. 1967, University of Maine		Fitz-Henley, Norman H.	Mass.
Carson, Culley C.	Conn.	Attended City College, New York	
B.S. 1967, Trinity College, Conn.		Frank, Sidney A.	
Chabalko, John J.	Pa.	B.A. 1967, Bowdoin College	
B.S. 1967, Muhlenberg College			

Furlow, Thomas W., Jr. B.A. 1968, George Washington University	Md.	Owens, David E. B.A. 1964, Wesleyan University	Pa.
Gardner, James S. B.S. 1967, Trinity College, Conn.	Mass.	M.S. 1965, University of Connecticut	
Garner, Steven C. B.A. 1967, University of Massachusetts	Mass.	Pash, Robert M. B.A. 1967, Gettysburg College	N.J.
Gens, John P., Jr. B.S. 1967, Trinity College, Conn.	Conn.	Pett, Stephen D. B.S. 1967, Seton Hall University	N.J.
Gerstein, Jared D. B.A. 1967, New York University	N.Y.	Polk, Norman O. B.A. 1967, Harvard University	D.C.
Gibbons, Gary R. B.S. 1967, Utah State University of Agriculture and Applied Science	Utah	Potenza, Anthony R. Attended University of Pittsburgh	N.Y.
Gibson, Douglas W. B.S. 1966, Wagner College	N.Y.	Pugatch, Robert D. B.A. 1967, Johns Hopkins University	N.Y.
Glowitz, Robert J. B.S. 1967, University of Maryland	Md.	Rainey, Edward C. B.S. 1967, George Washington University	Nebr.
Goldberg, Constance L. B.S. 1966, Pennsylvania State University	Md.	Reed, Barry S. B.A. 1967, University of Washington	Wash.
Goldstein, Howard S. B.A. 1967, Colgate University	N.J.	Rein, Richard A. B.A. 1967, University of Rochester	Md.
Goodman, Clifford J., Jr. Attended Arizona State University	Ariz.	Reisman, Jerald L. B.S. 1967, University of Michigan	Ohio
Gorman, Barry C. B.S. 1967, Tufts University	Conn.	Romig, Bruce B.S. 1967, Duke University	Va.
Greenwood, Mark W. B.A. 1967, University of Utah	Utah	Rosenberg, Robert L. B.A. 1968, George Washington University	N.J.
Gregg, David L. B.A. 1966, Northwestern University	Calif.	Ross, David B. B.S. 1967, Cornell University	N.Y.
Griffin, Ronald A. B.A. 1967, George Washington University	D.C.	Ruben, Richard S. B.A. 1967, Northwestern University	Pa.
Grogan, Thomas M. B.A. 1967, University of Virginia	Va.	Schlachter, Steven A. B.S. 1967, St. Peter's College, N.J.	N.J.
Gromet, Michael A. B.A. 1967, New York University	N.Y.	Schramm, Melinda M. B.S. 1967, Wheaton College, Ill.	Pa.
Grosse, Howard J. B.S. 1967, Tufts University	N.Y.	Schulman, Brian M. B.A. 1968, George Washington University	N.Y.
Hanscom, Jane L. B.A. 1967, University of Maine	Maine	Schultz, Verna E. B.A. 1968, George Washington University	Md.
Harris, Robert J. B.A. 1968, George Washington University	Md.	Shapiro, Leslie A. B.A. 1967, New York University	N.Y.
Holmes, John S. B.A. 1967, San Fernando Valley State College	Calif.	Smith, Howard N. B.S. 1967, St. Peter's College, N.J.	N.J.
James, William S. B.A. 1967, Johns Hopkins University	N.J.	Sonne, David D. B.S. 1968, University of Utah	Calif.
Jan, Ronald G. B.S. 1965, University of California, Berkeley	Calif.	Spector, Robert H. B.A. 1967, Franklin and Marshall College	N.Y.
Kline, Philip S., Jr. B.A. 1965, University of Texas at Austin	D.C.	Starkweather, Roger J. B.A. 1967, Northwestern University	Va.
Kuhr, Susan E. B.A. 1967, Yeshiva University	Ohio	Strauss, Barry L. B.A. 1967, Cornell University	N.Y.
Kurstin, Ronald D. B.A. 1967, Tulane University of Louisiana	Texas	Tan, Edwin C. B.S. 1967, Mount Union College	Thailand
Lee, Martin B.A. 1966, Columbia University	N.Y.	Tardiff, Jeffrey G. B.A. 1966, St. Michael's College	N.J.
Levy, Arnold G. B.A. 1968, George Washington University	Del.	Tauber, Ira B.A. 1967, Brooklyn College	N.Y.
Lojko, Edwin P. B.A. 1967, University of Virginia	Mass.	Travis, Barbara B. B.A. 1967, Bryn Mawr College	Md.
McBeath, John B. Attended San Jose State College	Nev.	Ungar, James R. B.A. 1967, George Washington University	N.J.
Mendelson, Michael B.A. 1965, C.W. Post College	N.Y.	Urrutia-S., Carlos O. B.S. 1966, Georgetown University	El Salvador
Mina, Norman B.A. 1967, New York University	N.Y.	Van Devanter, Stephen H. Attended George Washington University	Md.
Moritsugu, Kenneth P. B.A. 1967, University of Hawaii	Hawaii	Viener, Robert S. B.A. 1967, University of Pennsylvania	D.C.
Newton, Roger B.A. 1967, Yale University	Tenn.	Watt, Albert J. B.A. 1967, Brown University	Ohio
		Weiss, Richard W. B.A. 1966, Cornell University	N.Y.
		Whitley, Richard J. B.A. 1967, Duke University	N.J.

Woodward, Roger S.
B.A. 1966, Stanford University
Yip, Larry
B.S. 1967, University of Washington

Calif.

Wash.

Yoder, Paul T.

B.S. 1967, Eastern Mennonite College

Zieminski, John J.

B.S. 1967, Fordham University

Va.

N.J.

Summaries of Registration 1970-71

NUMBER OF REGISTRANTS

Class entering 1970.....	118	Class entering 1968.....	107
Class entering 1969.....	114	Class entering 1967.....	106

GEOGRAPHICAL DISTRIBUTION OF STUDENTS

Alabama	1	North Dakota	1
Arizona	3	Ohio	12
Arkansas	1	Oregon	1
California	36	Pennsylvania	20
Colorado	4	Rhode Island	1
Connecticut	18	South Carolina	2
Delaware	5	Tennessee	2
District of Columbia	24	Texas	3
Florida	5	Utah	13
Hawaii	2	Virginia	16
Idaho	2	Washington	25
Illinois	2	West Virginia	1
Indiana	2	Wisconsin	4
Iowa	1	Wyoming	1
Maine	2	Argentina	1
Maryland	69	Canada	3
Massachusetts	19	El Salvador	1
Michigan	2	Guatemala	1
Missouri	1	Haiti	2
Montana	1	Honduras	1
Nebraska	1	Mexico	1
Nevada	3	Nigeria	1
New Jersey	48	Portugal	1
New York	78	Thailand	1
North Carolina	1		

INSTITUTIONS IN WHICH SCHOOL OF MEDICINE STUDENTS EARNED DEGREES

Alfred University	2	California Lutheran College	1
American University	4	California State Polytechnic	7
Amherst College	2	College, San Luis Obispo	2
Antioch College	1	California, University of, Berkeley	2
Barnard College	1	California, University of, Davis	2
Boston University	6	California, University of, Los	2
Bowdoin College	2	Angeles	2
Brigham Young University	11	California, University of, Riverside	2
Brooklyn College	3	California Western University	1
Brown University	3	Carnegie-Mellon University	1
Bryn Mawr College	1	Carson-Newman College	3
C.W. Post College	1	Case Western Reserve University..	

Catholic University of America	1	Michigan State University	2
Clark University	2	Michigan, University of	4
Colby College	2	Millikin University	1
Colgate University	3	Mount St. Mary's College, Md.	1
Colorado State University	1	Mount Union College	1
Colorado, University of	2	Muhlenberg College	6
Columbia-Union College	1	Muskingum College	1
Columbia University	3	New York, City College	1
Connecticut, University of	3	New York, State University of,	
Cornell University	6	at Binghamton	1
Dalhousie University, Canada	1	New York, State University of,	
Dartmouth College	1	at Buffalo	1
Delaware, University of	1	New York, State University of,	
Dickinson College	3	at Stony Brook	1
Duke University	9	New York University	10
Eastern Mennonite College	1	Niagara University	1
Emory University	1	Northwestern University	6
Fairfield University	4	Notre Dame, University of	1
Florida Southern University	1	Oberlin College	1
Fordham University	1	Ohio Northern University	1
Franklin and Marshall College	7	Ohio State University	2
George Washington University	52	Ohio Wesleyan University	1
Georgetown University	2	Oregon, University of	1
Gettysburg College	4	Parsons College	1
Gonzaga University	1	Pennsylvania State University	5
Goucher College	1	Pennsylvania, University of	11
Grinnell College	1	Pittsburgh, University of	2
Harvard University	3	Princeton University	1
Harvey Mudd College	1	Redlands, University of	1
Hawaii, University of	1	Rhode Island, University of	1
Hofstra University	3	Richmond, University of	1
Hood College	1	Rochester, University of	2
Howard University	2	Rutgers University	11
Hunter College	1	Sacramento State College	1
Idaho, College of	1	St. John's University, N.Y.	1
Illinois, University of	1	St. Lawrence University	2
Indiana University	1	St. Michael's College	1
Iowa State University of Science		St. Peter's College, N.J.	6
and Technology	1	St. Vincent College, Pa.	1
John Carroll University	1	San Diego State College	1
Johns Hopkins University	11	San Fernando Valley State College	1
Kent State University	1	Scranton, University of	1
Kenyon College	2	Seton Hall University	1
Lafayette College	4	Simmons College	2
LaSalle College	3	Sir George Williams University,	
Lehigh University	1	Canada	1
Loyola University of Los Angeles		Smith College	1
Lycoming College	1	South Carolina State College	1
Maine, University of	1	Southern California, University of	2
Manhattan College	2	Stanford University	4
Marshall University	1	Sweet Briar College	1
Maryland, University of	1	Syracuse University	3
Massachusetts Institute of		Temple University	3
Technology	10	Texas Tech University	1
Massachusetts, University of	1	Texas, University of, at Austin.....	1
Methodist College	3	Trinity College, Conn.	10
Miami University	3	Tufts University	4

Tulane University of Louisiana.....	1	Weber State College	2
U.S. Naval Academy	1	Wellesley College	1
U.S. Naval Postgraduate School....	1	Wesleyan University	3
Utah State University of		Western Maryland College	1
Agriculture and Applied Science	1	Wheaton College, Ill.	2
Utah, University of	4	Whitman College	1
Valparaiso University	1	Williams College	4
Virginia Polytechnic Institute.....	1	Wisconsin, University of	2
Virginia, University of	5	Wright State University	1
Wagner College	2	Wyoming, University of	4
Washington State University	2	Yale University	2
Washington, University of	20	Yeshiva University	

Number of college graduates 421 Number of colleges represented .. 150

Recipients of the Degree of Doctor of Medicine, May 31, 1970

Name, State of Residence, Degrees Held

Flavius Abiola Akerele, Nigeria
 B.A. 1966, Boston University
Jules Richard Altfas, Arizona
 B.A. 1966, Arizona State University
Robert Anderson, Jr., Michigan
 B.S. 1966, Michigan State University
Joseph Milo Andrus, Kentucky
 B.S. 1965, Stanford University
Emanuel David Ascarelli, New York
 B.S. 1966, State University of New York
 at Albany
Thomas Edgar Bageant, District of Columbia
 B.A. 1966, Western Maryland College
John Andrew Balacki, New York
 B.S. 1966, Canisius College
Sherwood Washington Barefoot, Jr.,
 North Carolina
 B.A. 1963, Duke University
Gregory William Benkovic, Connecticut
 B.A. 1966, Johns Hopkins University
Robert Wayne Bonar, Idaho
 B.S. 1966, College of Idaho
Ronald Calvin Burton, Utah
 B.S. 1965, University of Utah
Dennis Lane Canon, New Mexico
 B.S. 1966, University of Arizona
Andrew Anthony Ceavatta, Jr., Pennsylvania
 B.A. 1966, Franklin and Marshall College
Nicholas Anthony Cerimele, Ohio
 B.S. 1965, University of Pittsburgh
Donna-Marie Therese Christian, Virgin Islands
 B.S. 1966, St. Mary's College, Ind.
Leo Joseph Patrick Clark, New Jersey
 B.S. 1966, University of Notre Dame
Gerald Fredric Davis, New York
 B.S. 1966, University of Missouri
James Ward Delameter, Washington
 B.A. 1966, University of Washington
George Gerald Edwards, California
 B.A. 1966, San Jose State College
Maureen Crittenden Edwards, District of
 Columbia
 B.S. 1966, Marquette University

Internship Appointment

Washington Hospital Center, Washington,
 D.C.
St. Elizabeths Hospital, Washington, D.C.
Memorial Hospital of Long Beach, Long Beach,
 Calif.
Latter-Day Saints Hospital, Salt Lake City, Utah
U.S. Naval Hospital, San Diego, Calif.
Madigan, General Hospital, Tacoma, Wash.
G.W. Service, D.C. General Hospital,
 Washington, D.C.
William A. Shands Teaching Hospital and
 Clinics, Gainesville, Fla.
University of Michigan Affiliated Hospitals,
 Ann Arbor, Mich.
University of California Medical Center,
 Los Angeles, Calif.
U.S. Naval Hospital, Oakland, Calif.
David Grant U.S. Air Force Center, Fairfield,
 Calif.
Memorial Hospital of Long Beach, Long Beach,
 Calif.
Mercy Hospital, Pittsburgh, Pa.
Presbyterian Pacific Medical Center, San
 Francisco, Calif.
State University-Kings County Hospital,
 Brooklyn, N.Y.
Brookdale Hospital Center, Brooklyn, N.Y.
Kaiser Foundation Hospital, San Francisco,
 Calif.
U.S. Naval Hospital, Oakland, Calif.
Children's Hospital, Washington, D.C.

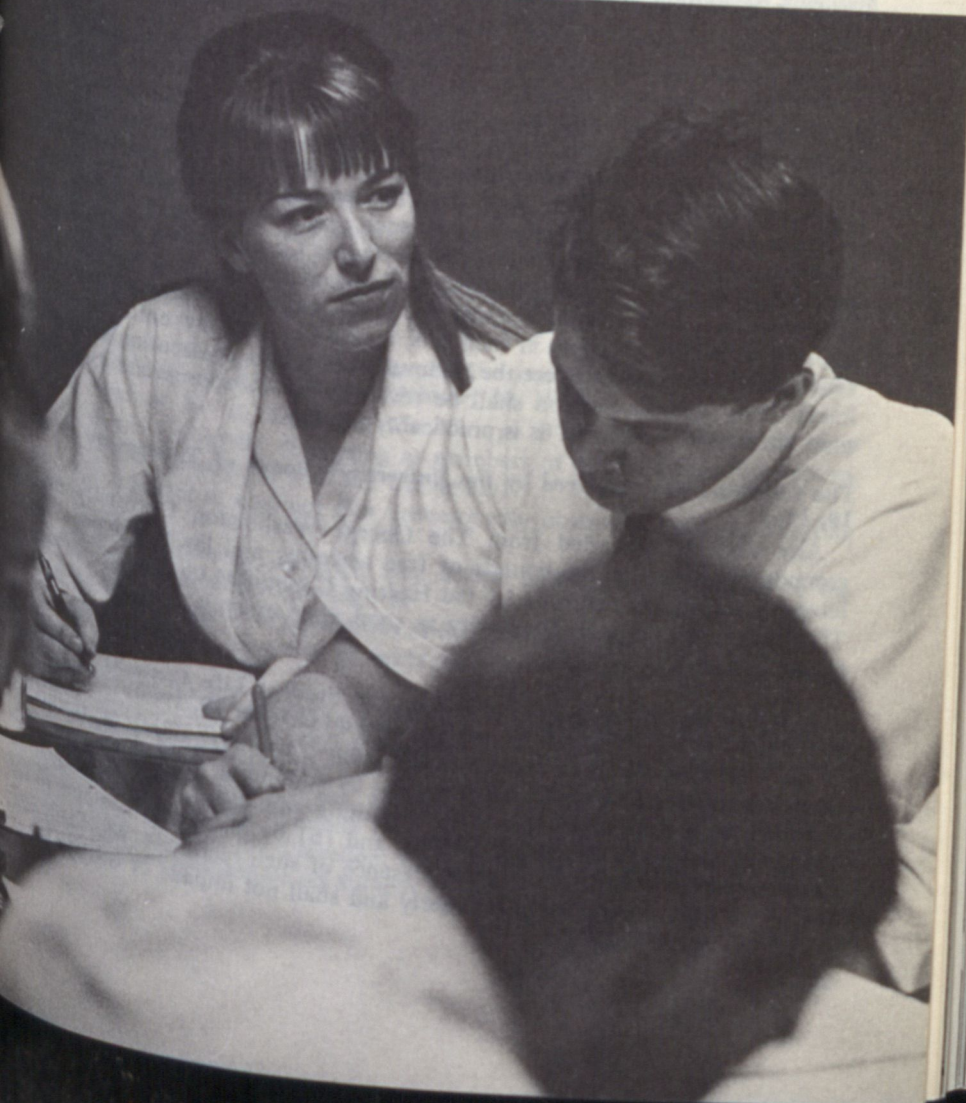
John Roy Emmett, Florida
 B.S. 1965, Georgia Institute of Technology
 M.S. 1968, Baylor University
 Robert Melvin Fine, Maryland
 B.A. 1967, George Washington University
 Gerald Penny Ford, New York
 B.A. 1965, Brigham Young University
 Peter Charles Freis, Jr., New Jersey
 B.S. 1966, St. Peter's College, N.J.
 Henry Francis Gardstein, Jr., New York
 B.A. 1966, Franklin and Marshall College
 Robert John Gerety, New Jersey
 B.A. 1962, Rutgers University
 M.A. 1966, Ph.D. 1967, Stanford University
 Peter R. Gerkin, New Jersey
 Jay Stephen Goldberg, New York
 B.A. 1966, State University of New York at
 Binghamton
 Eric Edwin Goranson, Washington
 B.S. 1966, Washington State University
 Kathryn Kenders Guyton, New Jersey
 B.S. 1966, Juniata College
 Charles Richard Hartz, Montana
 B.A. 1966, Concordia College, Moorhead,
 Minn.
 Robert Gerald Heinze, Maryland
 B.S. 1965, George Washington University
 S. Paul Herndon IV, Georgia
 B.S. 1966, Georgetown University
 Thomas Edward Higgins, New Jersey
 B.S. 1966, Fordham University
 Malcolm Douglas Hill, California
 B.S. 1965, Stanford University
 Edward Lloyd Hines, Connecticut
 D.D.S. 1967, Columbia University
 Jack Henry Hirsch, Pennsylvania
 B.A. 1966, Washington and Jefferson College
 Barbara Reddy Hoart, Pennsylvania
 B.A. 1966, University of Pennsylvania
 John Carl Hoefs, California
 B.A. 1966, California Lutheran College
 Jon Sigurd Huseby, New Jersey
 B.A. 1966, Brown University
 Roger Clark Husted, California
 B.S. 1966, Brigham Young University
 Taylor Alan Jeppson, Utah
 B.A. 1966, University of Utah
 Norman Bruce Jetton, Maryland
 B.A. 1967, George Washington University
 Michael Richard Jones, New Jersey
 B.A. 1966, Franklin and Marshall College
 Louis Tshisuaka Kanda, Congo
 B.A. 1966, University of California, Los
 Angeles
 John Joseph Katona, New York
 B.S. 1965, Pennsylvania State University
 Wilburn William Lewis Kent, Mississippi
 B.A. 1966, Johns Hopkins University
 Rodney Bernard Kovick, Montana
 B.S. 1966, University of Washington
 Ronald Bruce Lamb, California
 B.S. 1966, University of Redlands
 Charles Edward Law, Jr., Virginia
 B.S. 1966, George Washington University
 Paul Elwood Lewis II, Maryland
 B.A. 1966, Johns Hopkins University
 Richard Allan Lewis, New York
 B.A. 1966, Queens College, N.Y.
 Jon Edward Long, Arizona
 B.S. 1965, University of Arizona
 John William Lyles, Jr., Maryland
 B.M.E. 1954, Cornell University

Duke University Medical Center, Durham, N.C.
 Latter-Day Saints Hospital, Salt Lake City, Utah
 U.S. Public Health Service Hospital, San
 Francisco, Calif.
 New York Medical College, Metropolitan
 Hospital Center, New York, N.Y.
 Beth Israel Hospital, New York, N.Y.
 Stanford University Hospital, Palo Alto, Calif.
 Meadowbrook Hospital, East Meadow, N.Y.
 Medical College of Virginia Hospital, Richmond,
 Va.
 Marquette Affiliated Hospitals, and Milwaukee
 County General Hospital, Milwaukee, Wis.
 George Washington University Hospital,
 Washington, D.C.
 University of Oklahoma Hospitals and Veterans
 Administration Hospital, Oklahoma City,
 Okla.
 Washington Hospital Center, Washington,
 D.C.
 Children's Orthopaedic Hospital, Seattle,
 Wash.
 Greenwich Hospital, Greenwich, Conn.
 Bernalillo County Medical Center, Albuquerque,
 N.M.
 Greenwich Hospital, Greenwich, Conn.
 University of Michigan Hospital, Ann Arbor,
 Mich.
 George Washington University Hospital,
 Washington, D.C.
 George Washington University Hospital,
 Washington, D.C.
 University of Washington Affiliated Hospitals,
 Seattle, Wash.
 U.S. Army Medical Service Hospital, Letterman
 General Hospital, San Francisco, Calif.
 Latter-Day Saints Hospital, Salt Lake City, Utah
 Memorial Hospital of Long Beach, Long Beach,
 Calif.
 Germantown Dispensary and Hospital,
 Philadelphia, Pa.
 Washington Hospital Center, Washington,
 D.C.
 Royal Victoria Hospital, Montreal, Canada
 Strong Memorial Hospital of the University of
 Rochester, Rochester, N.Y.
 Veterans Administration Center-Wadsworth,
 Los Angeles, Calif.
 University of California Medical Center, Los
 Angeles, Calif.
 Good Samaritan Medical Center, Los Angeles,
 Calif.
 U.S. Naval Air Station Hospital, Jacksonville,
 Fla.
 North Shore Hospital, Manhasset, N.Y., and
 Memorial Hospital for Cancer and Allied
 Diseases, New York, N.Y.
 U.S. Naval Hospital, Oakland, Calif.
 Washington Hospital Center, Washington,
 D.C.

- William Stafford Lynch, Ohio
B.S. 1966, University of Notre Dame
- Winthrop Sylvester MacLaughlin, Jr., Connecticut
B.S. in Phar. 1966, Fordham University
- Warren Clark Marshall II, New Jersey
B.S. 1966, Pennsylvania State University
- Milton James Menchey, California
B. A. 1966, San Diego State College
- Malcolm Kent Mewha, Pennsylvania
B.A. 1966, University of Pennsylvania
- Paul Dennis Miller, Pennsylvania
(With Distinction)
B.A. 1965, Gettysburg College
M.S. 1966, George Washington University
- Paul Ralph Mitchell, Massachusetts
B.S. 1966, University of Massachusetts
- Thomas Eugene Moeser, Maryland
B.A. 1967, George Washington University
- Warren Frederick Muth, New York
B.A. 1964, Gettysburg College
- Fred Gordon Odere, New York
B.S. 1966, Carnegie-Mellon University
- Alan Joseph Oram, Pennsylvania
B.S. 1966, Mount St. Mary's College, Md.
- Robert Clark Osborne, California
B.A. 1966, University of California, Los Angeles
- Robert Clemmer Palmer, New Mexico
B.S. 1966, University of New Mexico
- John Cheung Pan, Hong Kong
B.S. 1966, University of Notre Dame
- Philip Paul, New York
B.A. 1964, Brandeis University
- George Cannon Pugsley, Utah
B.S. 1966, University of Utah
- Burton L. Redd, Texas
B.S. 1967, University of Utah
- John Stafford Rogers II, Maryland
B.S. 1966, University of Maryland
- Richard Mason Rytting, Utah
B.S. 1966, University of Utah
- Salvatore Carl Santangelo, Connecticut
B.A. 1965, Catholic University of America
- Joseph Boyle Sappington, Maryland
B.S. 1965, Georgetown University
- Anita Koosman Schnur, New Jersey
B.A. 1966, Rutgers University
- Gabriel Frank Sciallis, New Jersey
B.A. 1966, Rutgers University
- Samuel Jack Scott, Jr., Virginia
(With Distinction)
B.S. 1966, George Washington University
- Marc Robert Segall, New Jersey
Robert Jay Singer, New Jersey
B.S. 1966, Pennsylvania State University
- Charles Ira Smith, New York
B.S. 1966, Syracuse University
- Charles Edward Snyder, West Virginia
B.A. 1966, West Virginia University
- Michael Sandor Sommer, Maryland
B.A. 1959, M.A. 1964, George Washington University
- Harold Philip Strunk, Pennsylvania
B.A. 1966, Yale University
- Ralph Toshio Suetsugu, Hawaii
B.A. 1966, Johns Hopkins University
- Patrick Joseph Sullivan, Florida
(With Distinction)
Michael Eric Sussman, New Jersey
B.A. 1966, Franklin and Marshall College
- Richard Landon Taylor, Jr., Ohio
Cleveland Clinic Hospital, Cleveland, Ohio
- Hartford Hospital, Hartford, Conn.
- Geisinger Medical Center, Danville, Pa.
- York Hospital, York, Pa.
- Hartford Hospital, Hartford, Conn.
- Strong Memorial Hospital of the University of Rochester, Rochester, N.Y.
- Mary Hitchcock Memorial Hospital, Hanover, N.H.
- U.S. Naval Hospital, Portsmouth, Va.
- U.S. Army Medical Service Hospital, Tripler General Hospital, Honolulu, Hawaii
- Duke University Medical Center, Durham, N.C.
- U.S. Naval Hospital, Philadelphia, Pa.
- U.S. Naval Hospital, Camp Pendleton, Calif.
- University of California Medical Center, Los Angeles, Calif.
- Brookdale Hospital Center, Brooklyn, N.Y.
- Montefiore Hospital and Medical Center, New York, N.Y.
- University of California Medical Center, Los Angeles, Calif.
- Stanford University Hospital, Palo Alto, Calif.
- Washington Hospital Center, Washington, D.C.
- Medical Branch Hospitals, University of Texas, Galveston, Texas
- Presbyterian University Hospital, Pittsburgh, Pa.
- University of Maryland Hospital, Baltimore, Md.
- G.W. Service, Veterans Administration Hospital, Washington, D.C.
- George Washington University Hospital, Washington, D.C.
- G.W. Service, D.C. General Hospital, Washington, D.C.
- U.S. Naval Hospital, San Diego, Calif.
- New England Medical Center Hospital, Boston, Mass.
- Meadowbrook Hospital, East Meadow, N.Y.
- Brooke General Hospital, San Antonio, Texas
- U.S. Naval Hospital, Bethesda, Md.
- Reading Hospital, Reading, Pa.
- Queen's Hospital, Honolulu, Hawaii
- University of Miami Affiliated Hospitals, Jackson Memorial Hospital, Miami, Fla.
- Kaiser Foundation Hospital, San Francisco, Calif.
- Cleveland Clinic Hospital, Cleveland, Ohio

Paul Jan Thomas, Maryland
 B.S. 1966, University of Maryland
 Eric Martin Wagshal, District of Columbia
 B.A. 1967, George Washington University
 Richard Lavell Ward, Idaho
 B.S. 1966, Brigham Young University
 Michael DeMonte Washburn, Utah
 Victor Peter Wasilauskas, Connecticut
 B.S. 1966, Mount St. Mary's College, Md.
 Melvin Phillip Weinstein, New Jersey
 B.A. 1966, Rutgers University
 Joseph Daniel Welch, New York
 B.A. 1966, Johns Hopkins University
 Richard Michael Whalen, Montana
 B.S. 1966, Montana State University
 John Duane Wojcik, New Jersey
 (With Distinction)
 B.S. 1966, Georgetown University
 Craig Duryea Woodward, New York
 B.A. 1966, Johns Hopkins University
 Michael Bruce Wooten, Virginia
 B.S. 1966, Washington State University

Walter Reed General Hospital, Washington,
 D.C.
 Washington Hospital Center, Washington, D.C.
 U.S. Public Health Service Hospital, Baltimore,
 Md.
 U.S. Naval Hospital, Oakland, Calif.
 Washington Hospital Center, Washington, D.C.
 Hartford Hospital, Hartford, Conn.
 Rochester General Hospital, Rochester, N.Y.
 North Shore Hospital, Manhasset, N.Y., and
 Memorial Hospital for Cancer and Allied
 Diseases, New York, N.Y.
 Harvard University Service, Boston City
 Hospital, Boston, Mass.
 University of Miami Affiliated Hospitals,
 Jackson Memorial Hospital, Miami, Fla.
 University of Arizona Affiliated Hospitals,
 Tucson Hospitals Medical Education
 Program, Tucson, Ariz.



APPENDIX: RECENTLY ESTABLISHED REGULATIONS

THE FOLLOWING UNIVERSITY REGULATIONS are under review and may be subject to change in connection with the establishment of judicial processes. Bulletins and handbooks incorporating any changes will be issued as appropriate.

The following resolution, submitted by the University Senate, was approved by the University's Board of Trustees on October 19, 1968:

Whereas, safety and order are essential preconditions of the learning process, and indeed of the very concept of a university; and

Whereas, The George Washington University is committed to protection of free speech and freedom of assembly, and to safeguarding the right of lawful protest on campus; and is committed equally to maintaining the peace and safety of the campus, in the knowledge that all rights are in jeopardy when violence and civil disorder prevail over law and reason;

Now, therefore, be it resolved by the Senate of The George Washington University: that in the event a demonstration at this University exceeds the bounds of free assembly and lawful advocacy, and demonstrators are engaging in unlawful acts which cause or imminently threaten injury to persons or property, or which obstruct or interfere with normal and necessary University activities, this body affirms the authority of the President, or other University officials designated to act in his absence, to take such reasonable steps, if possible after consultation with the Chairman of the Executive Committee of the University Senate and the President of the Student Body, as are required to restore and preserve order; including, if deemed necessary and appropriate, suspension of students or faculty engaging in such acts, and use of such law enforcement personnel as are needed to effect the removal, arrest, and prosecution of law violators. Any such suspension shall be reviewed by an appropriate tribunal as soon after order is restored as is practicably possible.

The following was approved by the University's Board of Trustees on October 19, 1968:

Any student suspended from The George Washington University on the grounds of exceeding the bounds of free assembly and lawful advocacy shall have his suspension reviewed by the Hearing Committee on Student Affairs of The George Washington University as soon after order is restored as is practicable possible.

The following resolution, submitted by the Student Life Committee, was approved by the University's Board of Trustees on October 19, 1968:

Be it resolved that The George Washington University: affirms its traditional commitment to freedom of expression (a) by continuing to permit business and government organizations which are recruiting employees to conduct their activities at designated places on campus, and (b) by placing no obstacle to students who may wish to protest the presence of such recruiters, provided, however, that such protest shall be orderly and shall not impede or disrupt the recruiter in his activities.

The University affirms its place as a forum for the free exchange of ideas (a) by assuring that guests invited to speak on this campus at duly scheduled meetings shall have the right to appear and to be heard, and (b) by sanctioning the freedom of students to express dissent from the views of the speaker, provided, however, that that expression of dissent be orderly and nonobstructive.

The University distinguishes between orderly protest and resistance-by-obstruction; it accepts the former as a legitimate expression of dissent while rejecting the latter as an abridgement of the freedoms of the individuals who may be its object.

The following was approved by the University's Board of Trustees on October 19, 1968:

The George Washington University is opposed to discrimination based on race, color, or creed. Such discrimination may have appeared in campus organizations in the past. In the future, however, no organization can be recognized or supported by the University unless it provides continued assurance of nondiscrimination in membership practices and in intent, considered adequate by relevant committees and officers of the University.

The following was approved by the University's Board of Trustees on October 19, 1968:

The University cannot condone violations of law, including violation of those laws which proscribe possession, use, sale, or distribution of certain drugs. Members of the academic community should know that administrative action, which may include dismissal from the residence halls, revocation of other privileges, or suspension or dismissal from the University, may be taken in order to protect the interests of the University and the rights of others.

The Board of Trustees reaffirms the responsibility of the President and the Faculty to continue to implement this policy.

The following resolution, submitted by the University Senate, was approved by the University's Board of Trustees on January 16, 1969:

Be it resolved by the Senate of The George Washington University: Any member of the University (including as members of the University all persons having a formal connection with the University)

- (a) who engages in conduct that unreasonably obstructs teaching, research, and learning, or
- (b) who unreasonably obstructs free access to members or guests of the University or to University buildings, or
- (c) who disobeys general regulations of the University, or
- (d) who damages University property or injures members or guests of the University,

may be punished for his conduct by dismissal from the University, or by some lesser disciplinary action, through procedures established within the University in order to insure due process, any student subject to dismissal or other disciplinary action on the grounds of violating any of the premises of this resolution shall have, at his discretion, the right of review of the action by the University Hearing Committee on Student Affairs.

ANNUAL ISSUES OF THE UNIVERSITY BULLETIN

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COLLEGE OF GENERAL STUDIES, Dean of the College

NATIONAL LAW CENTER, Dean of the Center

SCHOOL OF ENGINEERING AND APPLIED SCIENCE, Dean of the School

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Government and Business Administration, Public and International Affairs),
Office of Admissions

SCHOOL OF MEDICINE, Admissions Office, School of Medicine

SUMMER SESSIONS, Dean of the Summer Sessions

SCHEDULE OF CLASSES: FALL AND SPRING SEMESTERS, Registrar

SCHEDULE OF CLASSES: SUMMER SESSIONS, Dean of the Summer Sessions

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COLLEGES AND SCHOOLS—DEGREE PROGRAMS

COLUMBIAN COLLEGE OF ARTS AND SCIENCES: Associate in Arts (A.A.), Bachelor of Arts (B.A.), Bachelor of General Studies (B.Gen.Std.), Bachelor of Science (B.S.), Bachelor of Science in Environmental Health (B.S. in Env.Health), Bachelor of Science in Geodetic and Cartographic Science (B.S. in Geod. and Cart.Sc.), Bachelor of Science in Medical Technology (B.S. in Med.Tech.), and Bachelor of Science in Oceanography (B.S. in Ocea.)

GRADUATE SCHOOL OF ARTS AND SCIENCES: Master of Arts (M.A.), Master of Fine Arts (M.F.A.), Master of Music (Mus.M.), Master of Science (M.S.), Master of Science for Teachers (M.S. for Teachers), and Doctor of Philosophy (Ph.D.)

SCHOOL OF MEDICINE: Doctor of Medicine (M.D.)

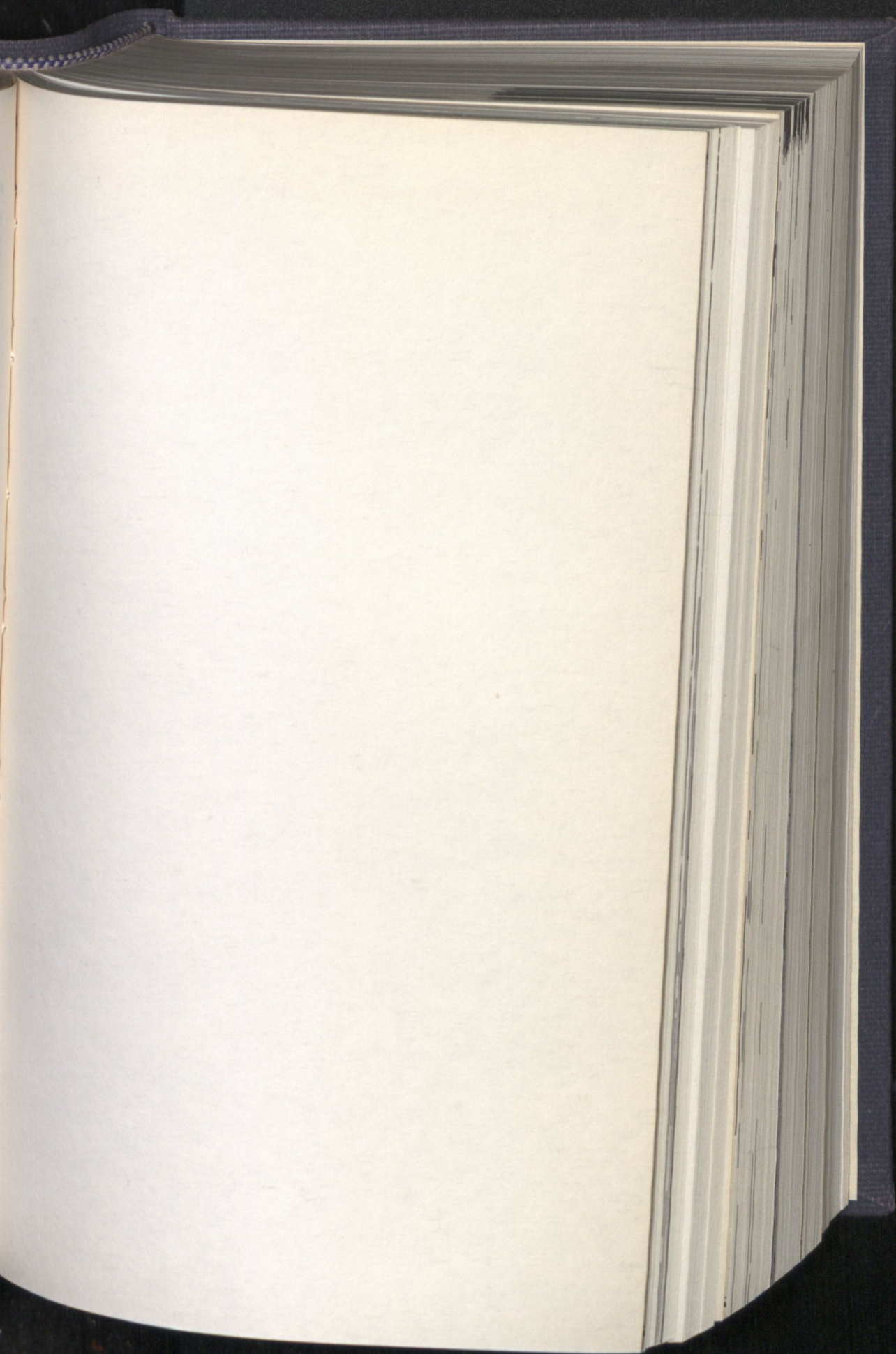
NATIONAL LAW CENTER: Juris Doctor (J.D.), Master of Laws (LL.M.), Master of Comparative Law (M.Comp.L.), Master of Comparative Law (American Practice) (M.Comp.L.(Am.Prac.)), and Doctor of Juridical Science (S.J.D.)

SCHOOL OF ENGINEERING AND APPLIED SCIENCE: Bachelor of Science (Civil Engineering) (B.S. (C.E.)), Bachelor of Science (Electrical Engineering) (B.S. (E.E.)), Bachelor of Science (Measurement Science) (B.S. (Meas.S.)), Bachelor of Science (Mechanical Engineering) (B.S. (M.E.)), Master of Science (M.S.), Master of Engineering Administration (M.E.A.), and Doctor of Science (D.Sc.)

SCHOOL OF EDUCATION: Bachelor of Arts in Education (B.A. in Ed.), Bachelor of Science in Physical Education (B.S. in P.E.), Master of Arts in Teaching (M.A.T.), Master of Arts in Education (M.A. in Ed.), Education Specialist (Ed.S.), and Doctor of Education (Ed.D.)

SCHOOL OF GOVERNMENT AND BUSINESS ADMINISTRATION: Bachelor of Business Administration (B.B.A.), Bachelor of Science in General Studies (B.S. in Gen.Std.), Master of Arts in Government (M.A. in Govt.), Master of Arts in Health Care Administration (M.A. in H.C.A.), Master of Business Administration (M.B.A.), Master of Public Administration (M.P.A.), Master of Science in Administration (M.S. in Adm.), Master of Urban and Regional Planning (M. of Urb. and Reg.Plan.), Graduate Certificate in Health Care Administration (Grad.Cert. in H.C.A.), Doctor of Business Administration (D.B.A.), and Doctor of Public Administration (D.P.A.)

SCHOOL OF PUBLIC AND INTERNATIONAL AFFAIRS: Bachelor of Arts (B.A.), Certificate of the Institute for Sino-Soviet Studies (Cert. of I.S.S.S.), Master of Arts (M.A.), and Master of Science in International Affairs (M.S. in I.A.)



THE GEORGE WASHINGTON UNIVERSITY

COLUMBIAN COLLEGE OF ARTS AND SCIENCES, 1821

THE GRADUATE SCHOOL OF ARTS AND SCIENCES, 1893

THE SCHOOL OF MEDICINE, 1825

THE NATIONAL LAW CENTER, 1865

THE SCHOOL OF ENGINEERING AND APPLIED SCIENCE, 1884

THE SCHOOL OF EDUCATION, 1907

THE SCHOOL OF GOVERNMENT AND BUSINESS ADMINISTRATION, 1928

THE SCHOOL OF PUBLIC AND INTERNATIONAL AFFAIRS, 1928

THE COLLEGE OF GENERAL STUDIES, 1950

THE DIVISION OF UNIVERSITY STUDENTS, 1930

THE SUMMER SESSIONS, 1916

THE UNIVERSITY HOSPITAL, 1898

THE UNIVERSITY'S
150TH ANNIVERSARY YEAR
1821-1971

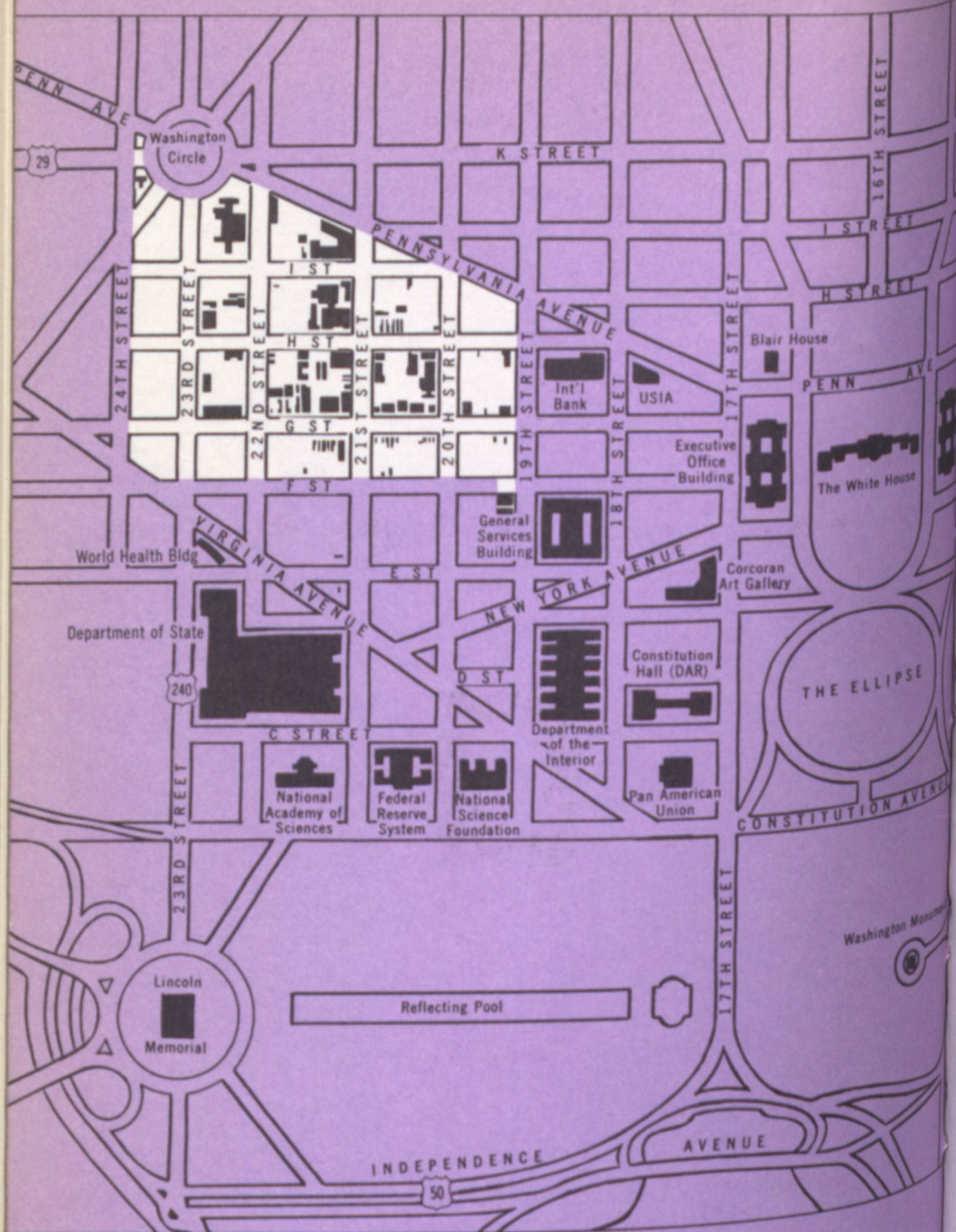
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NATIONAL
LAW
CENTER



1970-1971



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**THE NATIONAL LAW CENTER
1970-1971**

WASHINGTON, D.C. 20006



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1970

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THE CALENDAR 1970-71

1970 SUMMER TERM

- June 8* Registration for all sessions (12 am-7 pm) *Monday*
June 19 First session and 13-week session begin *Tuesday*
July 3 Holiday *Friday*
July 17 First-session classes end *Friday*
**July 20-22* First-session examination period *Monday-Wednesday*
July 23 Registration for students attending 2d session only (2-7 pm) *Thursday*
July 24 Second-session classes begin *Friday*
September 2 Last day of classes *Wednesday*
September 3-5 Second-session and 13-week session examination period *Thursday-Saturday*

1970-71 FALL SEMESTER

- †September 14-15* Registration *Monday-Tuesday*
 Application for February graduation due as part of registration
September 16 Classes begin *Wednesday*
October 9 S.J.D. dissertations of February candidates due *Friday*
November 11 Veterans Day (holiday) *Wednesday*
November 25 Thanksgiving recess begins after last class *Wednesday*
November 30 Classes resume *Monday*
December 19 Christmas recess begins after last class *Saturday*
January 4 Classes resume *Monday*
January 4 LL.M. theses of February candidates due *Monday*
January 8 Last day of fall-semester classes *Friday*
January 11-12 Reading period *Monday-Tuesday*
January 13-22 Examination period *Wednesday-Friday*

1971 SPRING SEMESTER

- †January 28-30* Registration *Thursday-Saturday*
 Application for June graduation due as part of registration
February 1 Spring-semester classes begin *Monday*
February 5 S.J.D. dissertations of June candidates due *Friday*
February 15 Winter Convocation and Observance of the University's Sesquicentennial (holiday) *Monday*
March 15 Application for 1971-72 teaching fellowships due *Monday*
April 3 Spring recess begins after last class *Saturday*
April 13 Classes resume *Tuesday*
May 3 LL.M. theses of June candidates due *Monday*
May 14 Last day of spring-semester classes *Friday*
May 17-18 Reading period *Monday-Tuesday*
May 19-28 Examination period *Wednesday-Friday*
May 31 Memorial Day (holiday) *Monday*
June 6 Commencement *Sunday*

1971-72 FALL SEMESTER

- September 13-14* Registration *Monday-Tuesday*

* Classes scheduled on Wednesday evenings for the 13-week session will meet on July 22.
 † Hours of registration will be announced in the *Schedule of Classes*, which will be available well in advance of each semester.

1970

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THE NATIONAL LAW CENTER

HISTORY

THE LAW SCHOOL, the oldest in the District of Columbia, was established in 1865 with a formal program of two years of study. This was largely through the efforts of the Reverend George Whitefield Samson, President of Columbian College, whose action resulted in the purchase of a separate building for holding law classes. This building had belonged to Trinity Church, of which Francis Scott Key had been Senior Warden. It was occupied by the Law School until 1884.

Sixty graduates, from twenty-two of the then thirty-seven states, received degrees in 1867. The School continued to have a student body and a faculty which reflected the fact that it was at the seat of our nation's government. Associate Justices David J. Brewer and John Marshall Harlan of the Supreme Court of the United States were among the prominent members of the bench and bar who served as lecturers.

In 1877, one year after the first such program was adopted in the United States, the Law School instituted a course leading to the degree of Master of Laws. In 1898, the course of instruction for the degree of Bachelor of Laws was extended to three years. The School took part in 1900 in the organization of the Association of American Law Schools. Later, women students were admitted, and in 1916 the first woman to take a regular course in law was graduated.

In the past quarter-century the Law School developed its course and seminar offerings with consideration for the needs of first-degree and graduate students. The degree of Doctor of Juridical Science was instituted in 1940. The needs of foreign lawyers who come to this country and who require additional preparation for law work in the United States resulted in the creation of programs for the degrees of Master of Comparative Law in 1946 and Master of Comparative Law (American Practice) in 1951.

National University, which had had an important place in legal education in the District of Columbia since 1869, was merged in George Washington University in August, 1954.

Programs of special research and study, such as the independent Patent, Trademark, and Copyright Research Institute, give richness to the basic curriculum.

The National Law Center, which was established in 1959, seeks to establish and coordinate programs of teaching, research, and creative development in law which will assist the profession to meet the demands placed upon it by contemporary society. Emphasizing an interdisciplinary approach to modern social, political, scientific, and economic problems having legal implications, the Center also encourages close relations with other appropriate units of the University.

In 1968, the Law Center established the degree of Juris Doctor as its first degree in law.

LOCATION IN THE NATION'S CAPITAL

Of special significance is the location of the National Law Center in the Nation's Capital, the focal point of the law in action, both American and international. The work of the Center goes on in this environment, presenting a unique opportunity for observation and study of federal agencies—judicial, legislative, and administrative. Readily accessible are the Supreme Court of the United States, the federal trial and appellate courts of the District of Columbia, and, in addition, federal courts of special jurisdiction, such as the United States Court of Claims, the United States Court of Customs and Patent Appeals, the Tax Court of the United States, and the Court of Military Appeals. Current federal legislation can be studied as it is considered by Congressional committees and as it comes up for debate on the floors of the House of Representatives and the Senate. With respect to the federal administrative agencies, students here in Washington have matchless opportunities for study and observation. They can attend informal and formal hearings of these agencies and can obtain from the docket sections complete records of administrative adjudication in specific cases. Illustrative of such federal agencies are the Interstate Commerce Commission and the Civil Aeronautics Board in the field of transportation; the Federal Trade Commission in the field of trade regulation; the Securities and Exchange Commission in the field of security issues and corporate finance; the National Labor Relations Board in the field of labor-management relations; the United States Patent Office in the field of patent law; the Federal Power Commission in the field of water, natural gas, and electric power; and the Federal Communications Commission in the field of radio and television.

Supplementing these environmental advantages of law in action are the exceptional research library collections in the Library of Congress, in the various departments of the Federal Government, and in the libraries of the headquarters of national and international organizations. The notable library of the Carnegie Foundation for International Peace has been acquired by George Washington University for use of research students in international and comparative law, fields with respect to which Washington has come to be called "The Capital of the World."

The years of residence at law school are years of participation in the life of the community, which in the case of the George Washington University National Law Center is the government of the United States. As a consequence, the study of law takes on added meaning, whether the goal be government service or practice, general or specialized, and whatever the community in which the student plans to practice.

OBJECTIVES

The primary purpose of the Center is to prepare men and women to meet the needs of society in the many fields of law, public and private. These needs call not only for technical skill but also for responsible leadership in the development of the law and the administration of justice. In fulfilling these responsibilities the Center conducts (1) a program of study in preparation for the practice of law, whether it be general practice, specialized practice, or government service; (2) the publication of a law journal containing the results of research in public law; (3) a series of student professional co-curricular activities; (4) study and research on an advanced level for foreign as well as for American students; and (5) a continuing legal education program for members of the bar.

Juris Doctor Program

THE WIDE GEOGRAPHIC DISTRIBUTION of the students who come to the Nation's Capital to study law makes this a truly national law school. Students from almost every state in the Union here join students from several foreign countries in their legal training. Last year over 370 colleges and universities were represented. The basic curriculum leading to the Juris Doctor degree is addressed to the development and application of legal principles, skills, and ideals which are indispensable to the equipment of a lawyer for professional responsibility and leadership in modern society. It includes, first and foremost, the traditional core of legal education, namely, the study of legal materials—judicial, statutory, and administrative—and instruction in the understanding and technique of their use. It also includes the study of the nature and purpose of law, the history of the Anglo-American legal system, and the history and standards of the legal profession; practice in the skills of legal research and legal writing; elementary training in trial and appellate practice; and, through the medium of seminars, experience in group handling of legal problems.

ENTERING CLASSES

The curriculum is organized so that students may begin the study of law for the Juris Doctor degree only at the start of the fall semester. Transfer students may enter at the start of the spring semester also.

ENTRANCE REQUIREMENTS

Admission to candidacy for the degree of Juris Doctor requires a Bachelor of Arts or equivalent degree from an accredited college or university, a satisfactory quality of work, and an acceptable distribution of courses. Eligibility is based on personal and scholastic records and on the result of the Law School Admission Test. No applicant will be acceptable in transfer who is ineligible to return in good standing to a previously attended law school. From the applicants, a selection is made by the Committee on Admissions.

Information concerning the Law School Admission Test may be obtained from the Dean of the National Law Center or from the Educational Testing Service, 20 Nassau Street, Princeton, N. J. 08540; or 1947 Center Street, Berke-

ley, Calif. 94704. The test is administered at various centers in the United States. It is anticipated that the testing dates for 1970-71 will be in October, December, February, April, and July. Completed application blanks and fees must be received by the Educational Testing Service at least two weeks before the date of the test. It is not necessary that formal application for admission be made prior to taking the test.

ADVANCED STANDING

Advanced standing toward the degree of Juris Doctor may be granted for work successfully completed in other law schools which are members of the Association of American Law Schools or are approved by the American Bar Association. Transferred credits will not be recognized in excess of those which might be earned in a similar period in the National Law Center.

Advanced standing will not be granted for law work already counted toward the Bachelor of Arts or other pre-legal degree.

TUITION DEPOSIT

Every student admitted to the National Law Center as a candidate for the degree of Juris Doctor must submit a \$100 tuition deposit after receipt of notification of acceptance. This deposit is credited toward tuition and is refundable in full only in cases of applicants called into military service; \$50 will be refunded if notification is received by July 1 that the student does not intend to enter in the fall, \$20 will be refunded if notification is received by September 1.

REQUIREMENTS FOR THE DEGREE

The student must have completed a residence period of three academic years (four years for evening students) and 84 semester hours of required and elective courses, with a cumulative average of at least 65. At least one academic year of residence and 28 semester hours are required of students admitted with advanced standing. The work of the final semester or summer session must be completed while in residence at the National Law Center. Credits allowed by way of advanced standing are not included in computing the average required for graduation.

Graduation Requirements.—See pages 37-38 for a statement of the graduation requirements.

HONORS

The degree of Juris Doctor "With Honors" is awarded students who obtain a minimum cumulative average of 75 but less than 85; the degree of Juris Doctor "With Highest Honors" is awarded students who obtain a minimum cumulative average of 85.

RESIDENCE

Candidates for the Juris Doctor degree must complete a residence period of three academic years. Attendance in the day division for the fall and spring

semesters constitutes residence for an academic year; similar attendance in the evening division constitutes residence for three-fourths of an academic year. Consequently, a day student must attend 6 semesters to meet residence requirements; an evening student must attend 8. Students authorized to take schedules of less than 10 hours in the day division or less than 6 hours in the evening division receive residence credit on a proportional basis. Students who attend the summer sessions receive fractional residence credit.

CURRICULUM

Required and Elective Courses.—A program of required and elective courses has been developed to assure coverage of the basic courses and allow a degree of flexibility to meet the diverse interests of students. At the present time, the first-year courses and one additional course are required, leaving a total of 52 hours of electives. It is important that students plan ahead regarding their electives.

Legal Writing.—Two semester hours of credit in legal writing are required after the first year for the Juris Doctor degree. This requirement may be met by service on the *Law Review* or by the satisfactory completion of a seminar which requires a research paper, Law 344 *Legal Writing*, or Law 598 *Research in Public Law*.

Trial Practice Court.—Classroom instruction is conducted in pleading and procedure, trial and appellate practice, and evidence. This instruction includes grounding in the principles of the Federal Rules of Civil Procedure and the Federal Rules of Criminal Procedure. Students participating in the work of the Trial Practice Court serve as junior counsel and as senior counsel in the trying of cases. A special section of the court is devoted exclusively to the trial of patent cases. Experience in preparing and arguing appellate court cases is available through the course in Appellate Practice and Procedure and through the Case Club Competition.

Patent Law.—The following courses are particularly suggested for students interested in patent law: Unfair Trade Practices, Patent Property, Patent Trial and Appellate Practice, Court Review of Patent Office Decisions, and Federal Antitrust Laws. Additional courses recommended are Advanced Topics in Patent Law and Trade Regulation Seminar.

Day Division

FIRST YEAR

FALL SEMESTER

Contracts I	4
Torts	4
Criminal Law and Procedure	4
Legal Research and Writing	2
Total semester hours	14

SPRING SEMESTER

Contracts II	2
Property I	4
Constitutional Law	4
Civil Procedure	4
Total semester hours	14

SECOND YEAR

FALL SEMESTER

Elective 14

Total semester hours 14

SPRING SEMESTER

Evidence 4

Elective 10

Total semester hours 14

THIRD YEAR

FALL SEMESTER

Elective 12

Legal writing requirement
(see page 11) 2

Total semester hours 14

SPRING SEMESTER

Elective 14

Total semester hours 14

Evening Division

FIRST YEAR

FALL SEMESTER

Contracts I 4

Torts 4

Legal Research and Writing 2

Total semester hours 10

SPRING SEMESTER

Contracts II 2

Criminal Law and Procedure 4

Civil Procedure 4

Total semester hours 10

SECOND YEAR

FALL SEMESTER

Property I 4

Elective 6

Total semester hours 10

SPRING SEMESTER

Constitutional Law 4

Elective 6

Total semester hours 10

THIRD YEAR

FALL SEMESTER

Elective 8

Legal writing requirement
(see page 11) 2

Total semester hours 10

SPRING SEMESTER

Evidence 4

Elective 6

Total semester hours 10

FOURTH YEAR

FALL SEMESTER

Elective	10
Total semester hours	10

SPRING SEMESTER

Elective	10
Total semester hours	10

SUMMER TERM OR NINTH SEMESTER

Elective	4
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THE LAW REVIEW

The *George Washington Law Review*, edited and managed by students of the National Law Center, is devoted exclusively to state and federal public law. The location of the University in the National Capital, where the primary sources of federal public law may be observed in operation, affords an unexcelled opportunity for specialization in this field.

The staff participates in a two-year *Law Review* program. The editorial staff is selected from among those students who have successfully completed the first year of *Review* work. Students receive four hours of academic credit for the two-year program.

THE JOURNAL OF LAW AND ECONOMIC DEVELOPMENT

The *Journal of Law and Economic Development* is a biannual publication of the Law Center, presenting articles and commentary on public and private international financial development, comparative law, and international law. In conjunction with a faculty adviser, it is managed and edited by a student board of editors. Third-year students serving on the board of editors may earn one or two semester hours of credit by registering for Law 346 *Credit Activities*.

THE STUDENT BAR ASSOCIATION

Every student in the Juris Doctor program is a member of the Student Bar Association, which is organized to enable students to become better acquainted with problems of the profession, to foster professional ideals, and to bring about closer contact with members of the profession engaged in active practice of the law. The work of the Student Bar Association is carried on by various committees and by group and general meetings of a professional and social nature. From time to time lectures are given by outstanding authorities on legal and professional problems.

An important activity is the Van Vleck Case Club Competition, which provides an opportunity for training in appellate advocacy. First- and second-year students participate as contestants before courts composed of members of the Faculty and the local bar. Senior law students of the Case Club also sit as judges. The final argument is held before a court composed of distinguished federal judges.

The Legal Aid Program is under the joint sponsorship of the George Washington University Student Bar Association and the Junior Bar Section of the District of Columbia Bar Association. Participating students assist court-appointed attorneys in the preparation of cases for trial or appeal. Qualified second- and third-year students are eligible for participation in the program.

The International Law Society is another activity supported by the Student Bar Association. The Society offers a forum for speakers in this field and provides a way in which its members can participate in international legal activities in Washington.

In the ranking of member associations by the American Law Student Association, the George Washington University Student Bar Association has received first place twice and second place twice in past years.

ORDER OF THE COIF

The Order of the Coif, a national honor society with chapters in over forty law schools, aims "to foster a spirit of careful study and to mark in a fitting manner those who have attained a high grade of scholarship." The George Washington University Chapter was established in 1926. Members are elected each year from the highest-ranking 10 per cent of the graduating Juris Doctor candidates.

Master's and Doctoral Programs

THE ADMINISTRATION OF JUSTICE under law is a matter so vast and complex that some who hold the Bachelor of Laws or Juris Doctor degree feel the need for further study. The Master's and doctoral programs give students the opportunity to broaden and deepen their understanding of the law.

The Master of Laws candidate may follow a program of general study or concentrate in one of the specialized areas listed below. Courses in each of these areas are included in the 401-600 series. Graduates who complete their work in one of these areas may have the field of specialization noted on their diplomas.

Administrative Law: Economic Regulation

Corporation Law

Government Procurement Law

Labor Law

Law and Poverty

Law, Psychiatry, and Criminology

Law, Science, and Technology

Natural Resources Law

Patent and Trade Regulation Law

Public International Law and Comparative Law

Taxation

Urban Legal Studies

Programs leading to the degree of Doctor of Juridical Science offer the advanced student the opportunity to concentrate on research and writing in a specific area of interest to the legal profession.

MASTER OF LAWS

ENTRANCE REQUIREMENTS

A Bachelor's degree from an accredited college or university* and a Bachelor of Laws, Juris Doctor, or equivalent degree from a law school which is a member of the Association of American Law Schools or is approved by the American Bar Association are required. The applicant must demonstrate (by a *B* average or equivalent performance measure, high class standing, *Law Review* experience, positions held, or professional achievements) that he is capable of Master's level work. Advanced standing is not granted for credits earned while a candidate for the first degree in law.

DEGREE REQUIREMENTS

The student must complete a residence period of not less than two semesters, which should be continuous. All requirements for the degree must be completed in this Law Center and in a period not exceeding three years from the time of registration for the degree. The student must complete 24 semester hours of courses as approved by his adviser and the Dean, including Law 599-600, *Thesis*. A minimum average of 75 is required.

Candidates for the degree in a selected field of specialization must complete a minimum of 12 of the required 24 semester hours in courses of the selected field. Each Master of Laws program of study should include a substantial number of 401-600 series courses.

MASTER'S THESIS

Each candidate for the degree of Master of Laws is expected to write a Master's thesis (Law 599-600) under the supervision of a member of the faculty of the National Law Center. Four hours of credit will be granted for successful completion of the thesis. The purpose of this requirement is to demonstrate the ability of the student to perform research in a special area of the law and to produce a scholarly paper containing the results of this research. The thesis is expected to be of substantially the same quality as a *Law Review* article. The requirement for a Master's thesis may be waived in appropriate circumstances.

The thesis in its final form must be presented to the Dean no later than the date specified in the Calendar. Two complete copies are required. It is the responsibility of the candidate to obtain from the Office of the Dean a printed copy of the regulations governing the styling and reproduction of theses. The mandatory thesis binding fee of \$10 must be paid at the time of registration for the last semester's work.

Accepted theses become the property of the University and are deposited in the Law Library, where the duplicate copies are bound and made available for circulation. Permission to publish or adapt material must be secured from the Dean.

HONORS

The degree of Master of Laws "With Highest Honors" is awarded students who obtain a minimum cumulative average of 85.

* The Dean is authorized to make exceptions in appropriate cases.

GRADUATE COURSES IN OTHER DEPARTMENTS

The Master of Laws candidate is encouraged to take graduate courses related to his field of interest in other departments of this University. A maximum of 6 semester hours will be credited toward the degree for such courses; however, credit will be granted only if the courses are given on campus. Courses numbered 101-200 may be taken for graduate credit only if the student receives the approval of the instructor at the time of registration and does additional work, as prescribed by the department offering the course.

CONSORTIUM OF UNIVERSITIES OF THE WASHINGTON METROPOLITAN AREA, INC.

A candidate for the Master of Laws degree may take graduate courses at Georgetown University Law Center through the Consortium of Universities of the Washington Metropolitan Area, Inc. A maximum of 6 semester hours of such courses will be credited toward the degree. Permission to take Consortium courses must be granted by the Dean and the Registrar.

DOCTOR OF JURIDICAL SCIENCE

ENTRANCE REQUIREMENTS

Admission to candidacy for the degree of Doctor of Juridical Science requires a Bachelor of Arts or equivalent degree from an approved college or university*; a Bachelor of Laws, Juris Doctor, or equivalent degree, earned with high rank, from a law school which is a member of the Association of American Law Schools or is approved by the American Bar Association; outstanding capacity for scholarly work in the field of law; and faculty approval of the applicant's dissertation topic. The applicant must also demonstrate his writing ability by submitting a copy of one or more papers or articles which he has written. He must submit an outline of his proposed dissertation topic in some detail, indicating by chapter and division within chapter the exact scope of the project. There should be a bibliography for each chapter listing books, reports, cases, and *Law Review* articles to be considered. Although the outline cannot predict every detail of the subsequent research, it must be sufficiently definite to afford the faculty a basis for evaluation.

DEGREE REQUIREMENTS

The candidate must complete (1) a residence period of not less than one academic year; (2) a course of study and research—designated by his consultative committee and approved by the faculty—of no less than 8 semester hours including *Jurisprudence*, unless previously taken, and two seminars in which research papers are required; and (3) an acceptable dissertation. The dissertation must be submitted no later than three years from the date of approval of the dissertation subject. The applicant who proposes to write on a comparative law topic must have a reading knowledge of the language in which the relevant materials are to be found. At the conclusion of his first year of residence, or

* The Dean is authorized to make exceptions in appropriate cases.

at such other time as the faculty may set, the candidate must pass an oral examination in those fields of study selected by the consultative committee. This examination is conducted by the consultative committee and such other members of the faculty and qualified experts as are selected by the faculty.

No later than the date specified in the Calendar, the candidate must submit to the Dean two complete copies of the dissertation and two original copies of an abstract (not to exceed 600 words) of his dissertation. One copy of the abstract is for inclusion in the *Abstracts of Doctoral Dissertations* issue of the University Bulletin; the other is sent to University Microfilms, Inc., for inclusion in their monthly publication, *Dissertation Abstracts*, which is distributed nationally.

Printed copies of detailed regulations regarding the form and reproduction of the dissertation, preparation of the abstract, and services offered by University Microfilms, Inc., are available in the Office of the Dean. The successful candidate for the doctorate is required, before receiving his degree, to pay a fee to cover the expense of printing the abstract of his dissertation, and for the basic service rendered by University Microfilms, Inc. To be acceptable the dissertation must, in the opinion of the examining committee, constitute a substantial contribution to the field of law concerned and be suitable for publication. Additional information will be supplied by the Dean. Accepted dissertations, with accompanying drawings, become the property of the University and are deposited in the Law Library, where the duplicate copies are bound and made available for circulation. Permission to publish or adapt material in them must be secured from the Dean.



Degree Programs for Foreign Students

THE NATIONAL LAW CENTER has several programs of study available to students trained in law outside the United States. These programs fall into two general categories: (1) those directed toward preparing the student for a bar examination in an American jurisdiction and (2) those that enable the student to return to his country with a more thorough understanding of some aspect of American law.

A student with a degree from a foreign law school is normally admitted to the Center as a Provisional Student, so that the faculty can evaluate his work before admitting him to degree candidacy. Appropriate credit will be granted for work taken as a Provisional Student.

In order to qualify for admission to the bar of an American jurisdiction, the student may apply for either the Juris Doctor (J.D.) or the Master of Comparative Law (American Practice) (M.Comp.L. (Am.Prac.)) degrees. The J.D. degree requires 84 semester hours of work in law school (credit is given for work in a foreign law school only in exceptional circumstances) and will qualify the student to take most U.S. bar examinations. The M.Comp.L. (Am.Prac.) degree requires 28 semester hours of work and satisfies the requirements of the District of Columbia Bar. *The student is cautioned to ascertain the requirements of the bar for which he intends to qualify prior to selection of his law school program.*

A student planning to return to his country may undertake a program leading to the degree of Master of Comparative Law (M.Comp.L.); or, if he has outstanding qualifications, he may undertake advanced work leading to the Master of Laws (LL.M.) or Doctor of Juridical Science (S.J.D.) degree. The M.Comp.L. degree programs enable the student to gain a broader comprehension of the American legal system by taking basic courses in the Law Center. The LL.M. and S.J.D. programs allow the student to work in advanced or specialized legal fields.

ADMISSION PROCEDURE

For general Admission information concerning all National Law Center students see pages 23-24.

Application, required records, and scores on the *Test of English as a Foreign Language* (see details below) must be received from *foreign applicants* no later than June 1 for the fall semester (April 1 for candidates for the Juris Doctor degree) and November 1 for the spring semester.

REQUIRED RECORDS

Applicants must request all educational institutions attended to send directly to the Dean official credentials listing subjects studied, grades received, examinations taken, and degrees received. Certified copies of diplomas and certificates from secondary schools and all colleges and universities attended are required. Records of state examinations and certificates are also needed. All records become the property of the University and *cannot* be returned.

LANGUAGE TEST

Students whose native tongue is not English are required to take the *Test of English as a Foreign Language*. Students are responsible for making arrangements for taking the test and should address inquiries to TOEFL, Educational Testing Service, Princeton, New Jersey 08540, U.S.A. The completed application form should be returned to the Testing Service at Princeton well in advance of the beginning of the semester for which the applicant seeks admission. The test fee, which should be remitted with the application, entitles the student to have his test score sent to three different institutions. Registration for the *Test of English as a Foreign Language* does not constitute application for admission to George Washington University.

The Bulletin of Information, obtainable without charge, contains a description of the test as well as rules regarding application, fees, reports, and the conduct of the test; lists of examination centers; examination dates; and an application blank. On the application for the test, the student should specify that the scores be sent to the Dean's Office.

ENTRANCE REQUIREMENTS

For the Degree of Juris Doctor.—Entrance requirements for foreign students are the same as those stated on pages 9–10, except that advanced standing is rarely granted for study in foreign law schools.

For the Degrees of Master of Comparative Law and Master of Comparative Law (American Practice).—The entrance requirements are the successful completion of and graduation from a course in arts, philosophy, letters, or sciences, equivalent to graduation from a gymnasium, lycee, or liceo; and graduation in law from a recognized foreign university.

For the Degree of Master of Laws.—The entrance requirements are the successful completion of and graduation from a course in arts, philosophy, letters, or sciences, equivalent to graduation from a gymnasium, lycee, or liceo; and graduation in law from a recognized foreign university. The applicant must demonstrate (by good academic record or equivalent performance measure, high class standing, positions held, or professional achievements) that he is capable of Master's level work and must demonstrate a sufficient background in the Common Law to undertake the Master's program.

For the Degree of Doctor of Juridical Science.—The entrance requirements are the successful completion of and graduation from a course in arts, philosophy, letters, or sciences, equivalent to graduation from a gymnasium, lycee, or liceo; graduation in law from a recognized foreign university; outstanding capacity for scholarly work in the field of law; and faculty approval of the applicant's dissertation topic. The applicant must also demonstrate his writing ability by submitting a copy of one or more papers or articles which he has written. He must submit an outline of his proposed dissertation topic in some detail, indicating by chapter and division within chapter the exact scope of the project. There should be a bibliography for each chapter listing books, reports, cases, and articles to be considered. Although the outline cannot predict every detail of the subsequent research, it must be sufficiently definite to afford the faculty a basis for evaluation.

DEGREE REQUIREMENTS

Juris Doctor, Master of Laws, and Doctor of Juridical Science.—Degree requirements for foreign students are the same as those stated on pages 10–13, 15, and 16–17.

Master of Comparative Law.—The student must complete a residence period of not less than two semesters, which should be continuous. All requirements for the degree must be completed in a period not exceeding three years from the time of registration for the degree. The student must complete satisfactorily 24 semester hours of approved courses of the Center, or of such other departments of the University as the faculty of the Center shall approve.

Master of Comparative Law (American Practice).—The requirements for this degree are the same as those for the degree of Master of Comparative Law except that the degree of Master of Comparative Law (American Practice) requires 28 semester hours of course work with a cumulative average of at least 65.

Unclassified Students

TWO TYPES OF STUDENTS may be admitted to the National Law Center as Unclassified Students, in accordance with the following regulations:

1. A candidate for a Bachelor of Laws or Juris Doctor degree with an above-average record at another law school which is a member of the Association of American Law Schools or is approved by the American Bar Association, may at the discretion of the Dean, be admitted as an Unclassified Student to earn credits for transfer to the other law school.

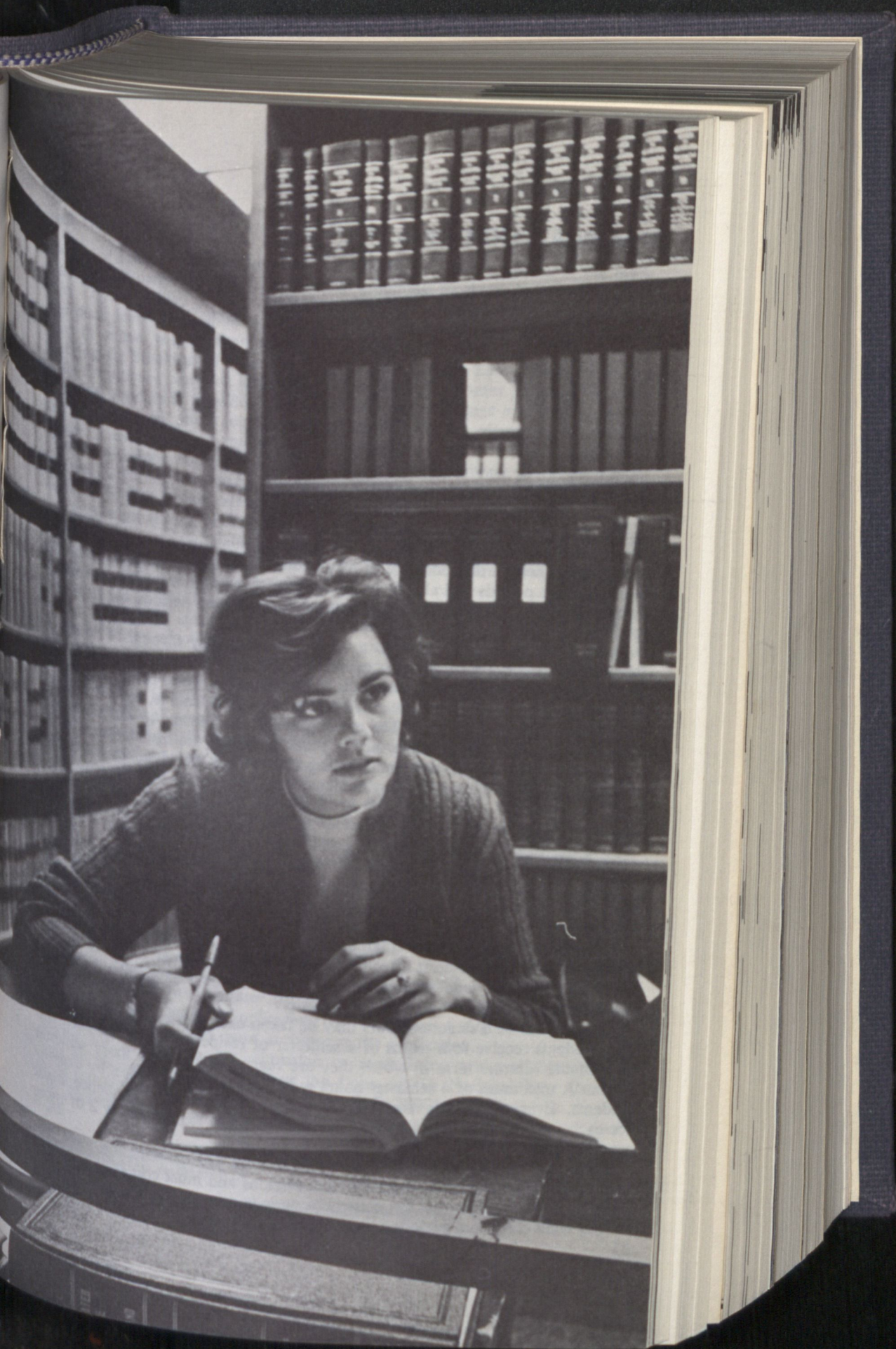
2. Graduates of law schools which are members of the Association of American Law Schools or are approved by the American Bar Association who wish to take advanced courses without pursuing degree programs may be admitted as Unclassified Students. Applicants with inferior records will not be admitted.

Unclassified Students participate in the work of the course, take examinations, and have their grades recorded. Credit earned as an Unclassified Student may be credited toward Master's and Doctor of Juridical Science degrees at this institution if the student transfers to degree status.

Continuing Legal Education

MEMBERS OF THE BAR wishing to keep abreast of current developments in the law may register for any of the courses in the National Law Center on a non-credit basis as Continuing Legal Education students. Such students do not take examinations in courses and no grades are recorded for their work.

A simplified admission and registration procedure is used and must be completed on or before the last day of regular registration for the appropriate semester. Continuing Legal Education students pay only the tuition fee on the semester-hour basis. They may not participate in student activities or benefit from the medical privileges of the University. (Continuing Legal Education registrations are subject to cancellation if courses are filled by regularly registered students.)



GENERAL INFORMATION

DAY AND EVENING CLASSES

DAY CLASSES meet in the mornings in fifty-minute periods and in the afternoons in fifty-minute periods and also in sessions of two fifty-minute periods, Monday through Friday. Trial Practice Court meets for two-hour periods on Saturday mornings.

Evening classes meet from 5:50 to 7:40 p.m., Monday through Friday. A four-credit course, e.g., Evidence, meets two evenings a week; a three-credit course, e.g., Administrative Law, meets two evenings a week for one-half the semester and one evening for the other half; a two-credit course, e.g., Contracts II, meets one evening a week. The evening division conforms to the standards of the day division, the full-time faculty participating in the instruction.

Examinations for both day and evening classes may be given in the afternoon only. Examinations for day students may be given in the evening only.

SUMMER TERM

A term of two sessions, with day and evening classes, is offered in the summer. Continuing students and transfer students may register for either or both sessions. *No beginning students are admitted to the Juris Doctor program in the summer term.*

The summer term is shorter than a semester of the academic year, and, as a consequence, a student must attend two and one-half summer terms to receive residence credit for one academic year or attend one and one-half summer terms to receive residence credit for a semester.

A maximum of 6 semester hours may be taken each session by day students. Day students receive four-tenths of a semester of residence credit for each session of the summer term in which they are registered for 3 or more semester hours. A maximum of 4 semester hours may be taken each session by evening students. Evening students receive three-tenths of a semester of residence credit for each session of the summer term in which they are registered for 2 or more semester hours.

Summer students planning to take the New York bar examination must register at the beginning of the term for both sessions and must complete both and carry a program of at least ten classroom periods a week for day students and at least eight classroom periods a week for evening students.

THE LAW LIBRARY

The Law Library of substantially over 100,000 volumes is housed in the modern Jacob Burns Law Library Building, adjoining Stockton Hall on the south side. This facility, opened for use on October 1, 1967, comprises nine floor and deck levels with about 49,000 square feet of floor space. Its shelf capacity now in place will accommodate over 170,000 volumes; with supplementary shelving in Stockton Hall and a small branch for the *Law Review* in Bacon Hall, the library provides space for almost 200,000 volumes. Seating for more than 450 readers is provided in four reading rooms, lounge and smoking areas, carrels, enclosed study cubicles, semi-private reading alcoves, and seminar rooms. Three photocopy machines are provided for reader use.

The collections comprise a comprehensive working library of Anglo-American law, with supplementary material in disciplines peripheral to law (such as business, finance, labor relations, sociology, criminology, political science, biography, foreign affairs, and others). Special areas are maintained for collections in tax law, labor law, patent-trademark-copyright law, international law, and foreign and comparative law. Included in the collections are the appellate decisions of all state courts and decisions of the federal courts, with comprehensive collections of English and Canadian court decisions; the currently annotated statutes of the 50 states; all federal statutes; English and Canadian statutes; selected statutes of other nations; and an extensive periodical collection, kept current by more than 700 subscriptions, covering virtually all American legal periodicals and most of those published in English throughout the world. The library is strong in its treatise holdings, administrative and regulatory materials, and Congressional coverage. The growing international law holdings include the European Economic Community, all recent material from the International Labor Organization, and current and retrospective collections of international treaties. A large portion of the holdings of the former library of the Carnegie Endowment for International Peace, acquired by the University in 1950, are in the Law Library, as is most of the library of the former National University Law School, which merged with George Washington University in 1954.

Admission

APPLICANTS ARE URGED to submit application forms and complete credentials well in advance of the semester for which they seek admission. Two recent signed photographs and an application fee of \$25 for a degree candidate, \$5 for an Unclassified Student, must accompany the application.

Forms for application for admission or readmission are available at and should be returned to the Office of the Dean of the National Law Center, George Washington University, Washington, D.C. 20006.

For further details concerning students from foreign institutions, see pages 18-20.

APPLICATION FOR ADMISSION

Juris Doctor Program.—Beginning students are admitted only at the start of the fall semester.

The applicant should register with the Law School Data Assembly Service (LSDAS) by completing and mailing the registration form supplied with each application blank. A transcript from each college or university attended should then be sent directly to LSDAS, Educational Testing Service, Box 944, Princeton, New Jersey 08540. No transcript should be sent to the National Law Center. The LSDAS will analyze the transcript and send a copy to this law school and others designated on the registration form. If the transcript which has been forwarded to LSDAS does not show evidence of receipt of a Bachelor's degree, the applicant will be asked, upon acceptance, to submit a final transcript directly to the National Law Center.

To provide time for the evaluation of credentials of beginning students, all papers, including the Law School Admission Test score, should be received by the National Law Center before April 1. This means that the October or December Law School Admission Test should be taken (see "Entrance Requirements," pages 9-10).

All papers of transfer students should be received by the Office of the Dean no later than May 1 for the fall semester, December 1 for the spring semester, and one month prior to registration for the summer session for which application is made.

Master's and Doctoral Programs.—Students are admitted at the beginning of the fall semester, the spring semester, or any of the summer sessions.

Application for admission, together with all required credentials, must be received by August 1 for the fall semester, December 15 for the spring semester, and one month prior to registration for the summer session for which application is made.

Unclassified Students.—Students are admitted at the beginning of the fall semester, the spring semester, or any of the summer sessions.

1. Application for admission, with required credentials, for a student who wishes to earn credits for transfer toward a Bachelor of Laws or Juris Doctor degree at another law school (see page 20), should be received at the Office of the Dean at least one month prior to the first day of registration for the semester or summer session for which application is made.

2. Application for admission, with required credentials, for lawyers who wish to take graduate courses (see page 20), should be received at the Office of the Dean by August 1 for the fall semester, December 15 for the spring semester, and one month prior to registration for the summer session for which application is made.

Continuing Legal Education Students.—Students file a simplified form at any time prior to the first day of classes of the term concerned. No application fee is required, and no credentials are necessary.

READMISSION

A student who was previously registered but did not attend during the most recent semester (summer term excluded) should file an application for readmission. Closing dates for readmission are the same as those for admission (see above).

If the student has attended one or more higher institutions during his absence from the University or if he applies as a degree candidate and was previously a nondegree student, he must have complete, official transcripts sent to the Dean.

Registration

BEFORE ATTENDING CLASSES each student must present himself in person for registration. No student will be registered until proper credentials have been filed and approved (see "Admission").

No registration is accepted for less than a semester or one summer session.

A student may not register concurrently in George Washington University and another institution without the prior permission of the dean of the college, school, or division in which he is registered in this University. Registration in more than one college, school, or division of the University requires the written permission of the deans concerned, *prior to registration*. Allowance of credit for work done concurrently at another institution will be at the discretion of the Dean.

ELIGIBILITY FOR REGISTRATION

No student who is suspended or whose record is not clear for any reason is eligible to register.

New Student.—Upon receipt of a *letter of admission* a new student is eligible for registration on the stated days of registration.

Readmitted Student.—A student previously registered who was not registered for courses during the preceding semester or summer session must apply for and receive a letter of readmission (see "Readmission," page 25) before he is eligible for registration.

TIME AND PLACE OF REGISTRATION

Registration is held in Stockton Hall, 720 Twentieth Street, N.W., during the following periods: *fall semester*, September 14 and 15; *spring semester*, January 28–30. Hours of registration will be announced in the *Schedule of Classes*, which will be available well in advance of each semester.

A late-registration fee of \$15 is charged each student who is permitted to register after the regular registration days.

Registration may be changed only with the permission of the Dean.



Fees and Financial Regulations

THE FOLLOWING FEES AND FINANCIAL REGULATIONS were adopted for the academic year 1970-71. (See page 27 for projected tuition increases for 1971-74.)

Tuition Fees

All law students except candidates for the degree of Doctor of Juridical Science:

Full-time program (11 hours or more), each semester.....	\$900.00
Part-time program, each semester hour.....	68.00
Doctor of Juridical Science,* including the final examination.....	1,900.00

University Center Fee (nonrefundable)

For students registered for 11 or more semester hours:	
Each semester.....	37.50
For students registered for less than 11 semester hours in a semester:	
For each semester hour for which the student registers.....	3.50
For students maintaining "continuous registration" status:	
Each semester	3.50

Graduation Fees

Juris Doctor, Master's, Doctor's degrees.....	25.00
Fee for binding Master's Thesis.....	10.00
Fee for Microfilm Service and Printing Abstract of Doctoral Dissertation	55.00

Residence Hall Fees (see page 40)

Special Fees

Application fee (degree candidate), nonrefundable.....	25.00
Application fee (unclassified student), nonrefundable.....	5.00
Application fee for room reservation, nonrefundable.....	100.00
Tuition deposit fee charged each student admitted to J.D. degree candidacy	100.00
Special fee (Student Bar Association activities, <i>Law Review</i> , and other services), charged each student (except students registered for "continuous registration") for each semester or any part thereof except the summer term	10.00
Fee for special examinations, for each subject.....	5.00
Late-registration fee, for failure to register within the designated period....	15.00
Continuous Registration fee, for post-J.D. students, to maintain "continuous registration" during any semester of absence from the University or after completion of tuition requirements.† Due and payable on the official days of registration.....	68.00

* The tuition fee is to be paid at the rate of \$475.00 a semester for four successive semesters, exclusive of the summer term or terms. No "continuous registration" fee will be charged if a third year is needed for completion of the degree requirements. If the Faculty should approve an extension of time, the student must maintain continuous registration and pay the continuous registration fee.

† The continuous registration fee applies toward neither financial nor residence requirements for the degree. This fee does not apply to students granted military leave (see page 38).

Service fee for deferred payment plan (see "Payment of Fees," below).....	\$5.00
Reinstatement fee, for reinstatement after financial suspension for non-payment of fees.....	15.00
Returned check fee, charged a student whose check is returned because of insufficient funds or improper drafting.....	15.00
Transcript fee, for each transcript of record.....	1.00

Registration on campus in the University entitles each student to the following University privileges: the services of the Student Career Services Office; the use of University Library; gymnasium privileges; admission to all athletic contests, unless otherwise specified; subscription to the *University Hatchet*, the student newspaper; admission to University debates; medical attention and hospital services as described under "Health Services" (see pages 41-42). These privileges terminate and a student is no longer in residence when he withdraws or is dismissed from the University.

PROJECTED TUITION INCREASES 1970-74

In order that students and their parents may plan more realistically, tuition increases for the academic years 1971-72, 1972-73, and 1973-74 have been estimated as follows:

*Increase by year (full-time students):

1971-72	\$150.00
1972-73	250.00
1973-74	150.00

Increase by semester hour (part-time students):

1971-72	6.00
1972-73	8.00
1973-74	6.00

Every effort will be made to keep tuition increases within the above limits. However, it is not possible to project future economic data with certainty, and circumstances may require an adjustment in these estimates.

PAYMENT OF FEES

All fees are payable at the Office of the Cashier. Checks and postal money orders should be made out to George Washington University. No student is permitted to complete registration or attend classes until all fees are paid.

Tuition and fees for each semester are due and payable in full at the time of each registration.

The Student Accounts Office has responsibility for creating, billing, and maintaining student accounts resulting from tuition and room and board charges. A student registered for six semester hours or more may sign a contract with this Office at the time of each registration permitting him to pay one-half of the total tuition and fees (except for fees payable in advance) at the time of registration and the remaining half on or before November 4, 1970 (for the fall semester), and March 17, 1971 (for the spring semester). A service fee of \$5

* These yearly increases are also projected for the total fee for work leading to the degree of Doctor of Juridical Science.

will be charged for the use of this deferred payment plan. The University will not obligate itself to notify the student, in advance, of the payment-due date for the second half of the semester charges. Students who fail to make any payment when due will be automatically suspended and may not attend classes until they have paid all accrued fees and a \$15 reinstatement fee and have been officially reinstated by the Student Accounts Office.

A student suspended for failure to meet payments when due may not be reinstated for the semester after two weeks from the date of suspension. Applications for reinstatement are to be made to the Student Accounts Office.

An auditor pays all fees chargeable to the student registered for credit.

In addition to the loan funds listed on page 31, there are various plans available, through the Girard Trust Exchange Bank, Philadelphia, Pa.; Funds for Education, Inc., Manchester, N.H.; and the Riggs National Bank, Washington, D.C.; by which students may, if they meet various conditions, borrow money on a relatively short-term basis.

Full details concerning these funds are available in the Office of the Dean.

WITHDRAWALS AND REFUNDS

Applications for withdrawal from the University or for change in class schedule must be made in person or in writing to the Dean. Withdrawal from courses is permitted after the midpoint of a semester only in extraordinary circumstances. Notification to an instructor is not an acceptable notice.

Refunds are granted only during the fall and spring semesters. No refunds are granted during the summer sessions. In authorized withdrawals and changes in schedule, cancellations of semester tuition charges and fees will be made in accordance with the following schedule:

1. *Complete withdrawal from the University:*

FALL SEMESTER

Withdrawal dated on or before September 25, 1970.....	90 per cent
Withdrawal dated September 28 to October 9, 1970.....	75 per cent
Withdrawal dated October 12 to October 23, 1970.....	50 per cent
Withdrawal dated after October 23, 1970.....	none

SPRING SEMESTER

Withdrawal dated on or before February 5, 1971.....	90 per cent
Withdrawal dated February 8 to February 19, 1971.....	75 per cent
Withdrawal dated February 22 to March 5, 1971.....	50 per cent
Withdrawal dated after March 5, 1971.....	none

- For a *change in status from full-time to part-time student* or for *partial withdrawal by a part-time student*, the above schedule applies to the difference in charges between the original program and the adjusted program continuing in effect.
- A student enrolled in a full-time program who drops or adds a course and continues to be in a full-time program will have no financial adjustments of tuition made other than those involving course fees.
- A student who is granted military leave before completing the semester will receive credits for current charges in accordance with the schedule for

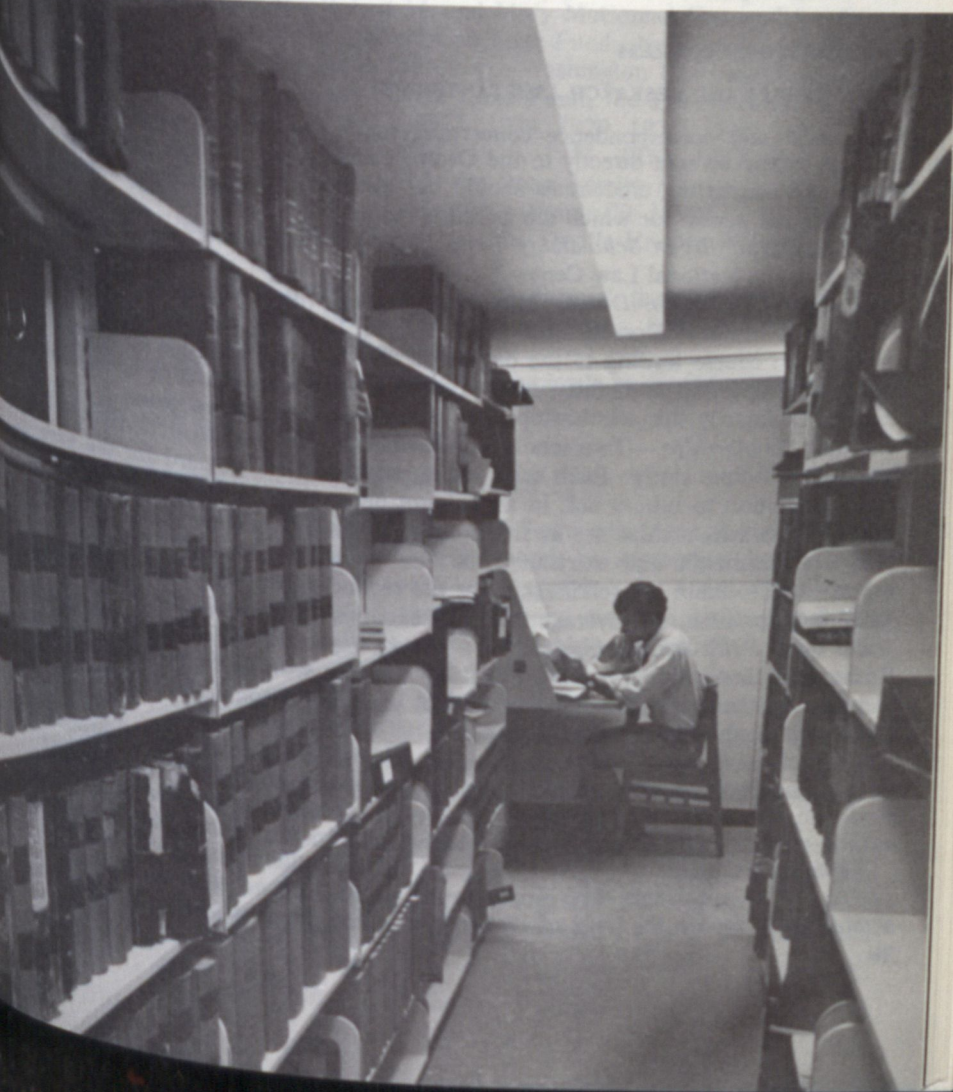
complete withdrawal from the University (see No. 1 above). Payments made in excess of the nonrefundable balance will be refunded to the student. The nonrefundable balance will be maintained as a deferred credit for use by the student when he returns to the University (see "Military Leave," page 38).

5. Regulations governing student withdrawals as they relate to residence hall and food service charges are contained in the specific lease arrangements.

In no case will tuition be refunded or reduced because of absence from classes. Payment applies only to the semester for which a registration charge is incurred and will not be credited to another semester (exception: students granted military leave, see page 38).

Authorization to withdraw and certification for work done will not be given a student who does not have a clear financial record.

Students are encouraged to provide their own cash funds until they can make banking arrangements in the community.



Financial Aid

THE NATIONAL LAW CENTER has been able in recent years to assist substantially all students in obtaining the financial aid they require, through full or partial scholarships, various loan programs, part-time employment, or a combination of these kinds of assistance.

LAW SCHOOL FINANCIAL AID SERVICE

An applicant for financial assistance is expected to supplement his personal application form with a Parents' Financial Information Form, processed by the Law School Financial Aid Service (LSFAS). A registration form for this service is included in the LSAT *Bulletin of Information*, or may be obtained from the National Law Center or by writing to LSFAS, Educational Testing Service, Box 944, Princeton, New Jersey 08540. The Parents' Form should be sent to the LSFAS, where it will be analyzed and duplicated and sent to each law school designated on the registration form.

JURIS DOCTOR PROGRAM

SCHOLARSHIPS AND RESEARCH ASSISTANTSHIPS

Application and correspondence concerning scholarships and research assistantships should be sent directly to the Dean. Unless otherwise specified, application and supporting credentials should be submitted no later than March 1 preceding the period for which the award is made.

Mildred Gott Bryan Scholarship Fund (1965).—Partial scholarship aid for students in the National Law Center.

Charles Worthington Dorsey Memorial Scholarship (1947).—Memorial to Charles Worthington Dorsey, LL.B. 1881, LL.M. 1882. A full-tuition scholarship for the course leading to the degree of Juris Doctor, awarded to a needy and promising graduate of this University with a Bachelor of Arts or equivalent degree. Ordinarily this scholarship is awarded once every three years.

Honor Scholarships.—Two scholarships available each year to students entering upon full-time study. Each scholarship provides a cash award for the first year in addition to tuition aid, in an amount depending on need, for all three years. These scholarships are awarded on the basis of outstanding college records, both academic and extracurricular; Law School Admission Test scores; and need. To retain the scholarship for the second and third years, the candidates must maintain a *B* average, both for each year and cumulative.

Phi Delta Delta Scholarships (1959).—Zeta Chapter of Phi Delta Delta Legal Fraternity (International), provides tuition aid to a woman student in the second year of the Juris Doctor program who excelled in scholastic achievement and service to the Center in her first year.

Research Assistantships.—Available each year to students currently enrolled. Each assistant receives an annual stipend. Awards are made on the basis of academic standing, financial need, capacity for leadership, and research and writing potential. Applications should be submitted no later than July 1.

Research Scholarships.—Available each year to students currently enrolled, preferably to applicants who are completing the second year. Scholarship awards are made on the basis of academic standing, financial need, capacity for

leadership, and research and writing potential. Applications should be submitted no later than July 1.

Trustee Scholarships.—Scholarships awarded each year to entering students, for tuition aid, in an amount depending on need, in the morning division. Candidates must have demonstrated qualities of leadership in addition to scholastic attainment. To retain the scholarship, the successful candidate must maintain a *B* average, both for each year and cumulative. Application must be made to the Dean before March 1.

Tuition-aid scholarships are also available to continuing second- and third-year full-time students with demonstrated scholastic ability, on the basis of financial need and capacity for leadership. Application should be made to the Dean prior to July 1. Scholarships are awarded after spring-semester grades are reported.

LOAN FUNDS

Through the generosity of friends of the University a number of loan funds are available. Among them are the Robert Ash Loan Fund; the George R. Beneman Loan Fund; the Robert M. and Mary McConnel Cooper Loan Fund; the District of Columbia Bar Association Loan Fund; the Harold L. and Violet George Foundation Loan Fund; the George Washington Law Association Loan Fund; the Jephson Educational Trust Loan Fund; the Law Association Loan Fund for the law classes of 1912, 1921, 1924, 1929, 1931, 1933, 1935, 1936, 1937, 1938, 1939, 1941, 1942, 1945, 1950, 1951, 1952, 1953, 1955, 1959, 1960, 1961, 1962, 1963, 1964, 1965; the Oscar Lawler Memorial Loan Fund; the Horace L. Lohnes Memorial Assistance Fund; the Jessie B. Martin Loan Fund; the Mike Pelekiri Loan Fund; and the Orville Hassler Walburn Memorial Loan Fund.

In addition, financial assistance is available through the Guaranteed Student Loan Program, National Defense Education Act loans, the American Bar Association Loan Program, and other sources.

Application for financial assistance should be made in the Office of the Dean.

MASTER'S AND DOCTORAL PROGRAMS

FELLOWSHIPS AND RESEARCH OPPORTUNITIES

Application should be made before March 15 preceding the period for which the award is made. The applicant should submit an application for admission as a degree candidate and a personal letter applying for a fellowship to the Dean. The letter of application should contain complete biographical data, information as to experience in practice or teaching and his draft or military status, copies of or citations to his published legal writings, and such other information as he believes will be of assistance in the consideration of his application. He should arrange for letters of recommendation to be sent from two members of his law faculty directly to the Dean. His academic rank in class should be included either in the transcript of his law school record or in the letters of recommendation.

Computers-in-Law Fellowship.—Available each year to a post-J.D. student who has competence in some aspect of applied computer science and is conversant with at least one programming language sufficient to enable him to code his own system design. The recipient will receive a stipend of \$6,000 plus

tuition for the academic year for research and related study in the combined computer and law disciplines. His study is under the direction of a faculty member associated with the Computers-in-Law Institute. University courses in computer software or hardware will be available, if needed, as part of his degree program.

Thomas Alva Edison Fellowship.—A \$6,000 fellowship for advanced study of the patent and related systems, made available annually to the Patent, Trademark, and Copyright Research Institute of the University by the Thomas Alva Edison Foundation for award to a qualified advanced student in one of the schools of the University. The recipient of the fellowship is expected to follow an approved program of research under the supervision of a member of the Staff of the Patent, Trademark, and Copyright Research Institute assigned as counselor to the fellow. He must satisfactorily complete the degree requirements, including a thesis on a subject in a field of the Institute's interest. This fellowship can be made available to the same candidate for two consecutive years when the Research Institute considers such extension to be in the best interests of the fellowship objectives.

Fellowship in Government Procurement Law.—A fellowship of \$6,000 plus tuition, for a program leading to the degree of Master of Laws with specialization in Government Procurement Law. The fellow takes 12 semester hours of approved courses over two semesters. The balance of his time is spent in research, writing, and editorial work under the guidance of the staff of the University's Government Contracts Program. The candidate is chosen on the basis of ability to do superior legal work, demonstrated by law school record or work experience, and genuine interest in government procurement law.

Richard Paul Momsen Fellowship for Brazilian Graduate Law Students.—Bequest of Richard Paul Momsen, LL.B. 1912. Awarded 1970-71 and alternate years, for the study of U.S. constitutional law.

Teaching Fellowships.—Two fellowships available each year with a stipend of \$6,000 plus tuition for an approved course of study leading to an advanced degree. Teaching fellowships are awarded for a term of two academic years. Fellows conduct the first-year course in Legal Research and Writing, hold regular class meetings, and work with the students to improve their legal writing ability.

Research Study Opportunities.—Research assistantships providing opportunity for graduate study with the program of Law, Science, and Technology and with the Government Contracts Program.

Prizes

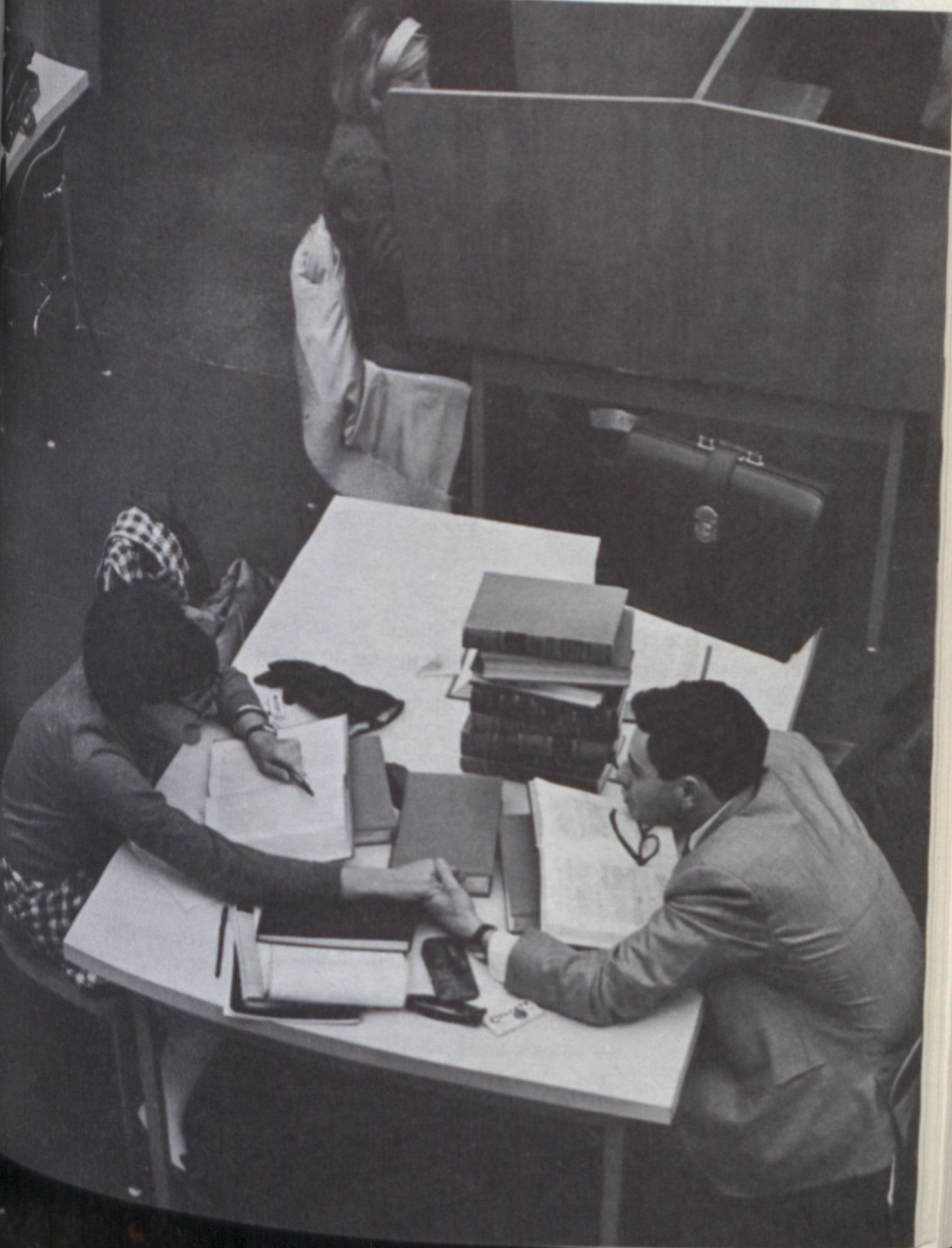
Charles Glover Prize.—Established by Charles Carroll Glover, Jr., an Honorary Trustee of the University, in memory of his great-grandfather, an illustrious member of the bar of the District of Columbia. Consists of selected law books. Awarded annually to the student who has attained the highest average grade in the third-year, full-time course.

Kappa Beta Pi Prize.—A selected legal publication awarded annually by Eta Alumnae Chapter to the woman law student who attains the highest average for the first year.

John Bell Larner Prize.—By bequest, a medal awarded annually to the member of the graduating class who attains the highest average grade in the entire course for the degree of Juris Doctor.

John Ordronaux Prizes.—By bequest, \$75 awarded annually to the student who has attained the highest average grade in the first-year, full-time course; and \$75 to the student who has attained the highest cumulative average grade at the end of the second-year, full-time course.

Jennie Hassler Walburn Prize.—A cash award to the outstanding student in the field of civil procedure, established by the will of the late Professor Orville Hassler Walburn in memory of his mother.



Regulations

ACADEMIC WORK LOAD

Juris Doctor Candidates.—Juris Doctor candidates without substantial outside employment may take a program of studies of 14 hours a week. Such students may take courses in the evening only if they are not available in the day time and if a majority of the hours taken are in day courses. The Dean is authorized to approve 15-hour programs in exceptional cases. Students with 20 hours or more of outside employment, whether in the day or evening division, must take a limited program of studies not exceeding 10 hours a week. Students taking a majority of their classes in the evening may not take more than 10 hours a week; the minimum load is 8 hours, except in special cases where 6 hours may be approved by the Dean for a limited time. A minimum schedule of 11 hours in the day division is required except in exceptional circumstances when a reduced program is authorized by the Dean.

Students taking more than 8 hours in the day division or 4 hours in the evening division must have the permission of the Dean to take a Bar Review course.

Students may transfer from the day division to the evening division only with the permission of the Dean.

With the approval of the Dean, second- and third-year students may take a maximum of 6 semester hours of appropriate courses in other departments of the University; such a student must receive a grade of at least High Pass or B to obtain credit for such courses, and in no event will the grade count in computing his cumulative average.

Master's Candidates.—Master's candidates without substantial outside employment may take a maximum of 12 hours a week. Students with 20 hours or more of outside employment must take a limited program of study not to exceed 8 hours a week. The minimum load is 4 hours unless approval for fewer hours is given by the Dean for a limited time.

ATTENDANCE

Regular attendance at classes is required and is necessary for successful work. A student who is deficient in class attendance in any course may be barred from taking the examination.

CHANGES IN PROGRAM OF STUDIES

A student may not drop or add courses or change from one section to another of the same course without the approval of the Dean.

RESEARCH PAPER IN LIEU OF EXAMINATION

The preparation of a research paper is required in lieu of an examination in seminars and in other courses, as indicated in the course descriptions. The research paper must be submitted by the last day of classes of the semester; for sufficient reason, the instructor may extend this time to the end of the examination period. No further extension may be granted. Students who are candidates for the J.D. degree may register for one such course in each semester of their third year; with the approval of the Dean such students may register

for more than one such course each semester. Approval of the Dean is required for second-year students to take such courses.

EXAMINATIONS

Written examinations are held at the end of most courses. Every student is required to take the regular examinations unless excused. No excuse for absence will be granted except by the Dean and then only for illness or other emergency. Application for excuse must be made in writing not later than one month after the date of the examination. An entry of *I*, incomplete, will be made on the record of a student thus excused. To receive credit for the course, he must take the next regularly scheduled examination. The examination may not be taken after exclusion for low scholarship.

Permission to take an examination before the regularly scheduled date will not be granted. Permission to take a postponed examination is limited to the situation provided for in the preceding paragraph.

A student who has been excused from taking a regular examination and who is a candidate for a degree to be conferred prior to the next regular examination in the subject may petition the scholarship committee, which may authorize such action as the circumstances require.

If a student fails to take an examination, a grade of 45 will be recorded unless he has been excused from the examination as provided above or has obtained the Dean's permission to drop the course.



CREDIT/NO CREDIT OPTION

Candidates for the degree of Juris Doctor may take, in addition to courses regularly given on a "credit/no credit" basis, 3 semester hours of elective course work on a "credit/no credit" basis.

GRADES

Grades are given in numerical terms equivalent to letter grades as follows: 85-100, *A*, excellent; 75-84, *B*, good; 65-74, *C*, satisfactory; 55-64, *D*, poor—below standard for graduation; 45-54, *F*, failure. In courses 220, 321-22, 346, 365, 366, 385, 386, and 459 grades are *CR*, credit; *NC*, no credit. A student who has been excused from failure to take a regularly scheduled examination is given the grade of *I*, incomplete, and a student who has been barred from taking an examination because of excessive absences is given the grade of *EA*. See "Examinations" (page 35) for grade upon failure to take an examination. Grades between 55 and 100 indicate that the work has been completed and credit given. Grades between 55 and 64, however, do not represent satisfactory work and adversely affect a student's cumulative average. No credit is given for grades below 55. A student may not repeat a course he has failed.

The cumulative average of a student includes all grades in all courses taken while he is a candidate for a particular degree. When a course is repeated (see "Academic Dishonesty," page 38), both the first grade and the subsequent grade or grades are counted in the cumulative average.

EXCLUSION AND PROBATION FOR POOR SCHOLARSHIP

Candidates for the Degree of Juris Doctor.—A student whose cumulative average at the end of any semester falls below 65.0 but is above 64.0 will be notified that he is on probation. If such a student fails to raise his cumulative average to 65.0 at the end of the next semester, he will not be permitted to register for any succeeding semester unless he petitions for and receives the permission of the Scholarship Committee.

A student whose cumulative average at the end of any semester falls below 64.0 will not be permitted to register for any succeeding semester unless he petitions for and receives the permission of the Scholarship Committee so to register.

A student who fails more than one course over his entire period of law study will not be permitted to register for any succeeding semester unless he petitions for and receives the permission of the Scholarship Committee.

A student who is not permitted to register under the foregoing provisions will be excluded as of the beginning of the semester for which he was ineligible to register.

Students who are registered at the time they receive notice that they will not be permitted to register for the next semester are entitled to withdraw from school and to receive a full refund of the tuition for the semester, or to complete the work for which they are registered.

Any student excluded may petition for reinstatement; if he can demonstrate that his low grades were due to circumstances beyond his control and that he has the capacity to pursue the study of law with a definite likelihood of success, he may be readmitted subject to such conditions as may be imposed by the Scholarship Committee.

Despite the above provisions, a student will be allowed to complete his first two semesters of law study before he is denied permission to register for a succeeding semester.

The term "semester" includes a session of the summer term.

Candidates for Masters' and Doctoral Degrees.—A candidate for a Master's or doctoral degree whose work is not satisfactory in the opinion of the faculty, taking into consideration the requirements and standards for the degree, may, by action of the faculty, be excluded at the end of the semester for which he is currently registered.

Unclassified Students.—An unclassified student whose work is not satisfactory in the opinion of the faculty may, by action of the faculty, be excluded at the end of the semester for which he is currently registered.

SUMMER SCHOOL CREDIT

Students planning to attend summer school sessions at other law schools and desiring to use credits obtained at such schools in their Juris Doctor program at this Center must first have the courses they wish to take approved by the Dean. In no event will credits be recognized in excess of those which might be obtained in a similar period in this program.

TRANSCRIPTS OF RECORD

Official transcripts of student records will be issued on request of the student or former student. A fee of one dollar is charged for each transcript. No transcript will be issued for a person who does not have a clear financial record.

CONTINUOUS REGISTRATION

Degree candidates are expected to maintain continuous registration until all degree requirements are satisfied. By failing to register for one semester or more, the student breaks his registration and must be readmitted (see "Readmission," page 24). A "Readmitted Student" is required to satisfy the curriculum requirements existing at the time of his readmission. Post-J.D. students who have completed course registration may maintain continuous registration by paying the "continuous registration" fee (see page 26). *J.D. degree candidates may not maintain continuous registration by paying the "continuous registration" fee.*

GRADUATION REQUIREMENTS

Diplomas are awarded at a February Convocation, at a June Commencement, and in September.

To be recommended by the Faculty for graduation, a student must have met the admission requirements of the National Law Center; completed satisfactory the scholarship, curriculum, residence, and other requirements for the University. Registration, either for the course work or on the "continuous registration" fee basis, is required for the semester or summer session immediately preceding the awarding of the degree.

Application for Graduation.—An "Application for Graduation" form must be filed and the appropriate fee paid at the time of registration for the last semester or summer session of the final year. Students completing degree re-

quirements during the Summer Sessions will be awarded diplomas (no formal convocation) September 30, *provided* they have completed all degree requirements and have applied for graduation as a part of registration for the Summer Sessions.

ACADEMIC DISHONESTY

Academic dishonesty on the part of any student will result in a disciplinary grade of *F* for the course involved and also may, upon the recommendation of the Dean's Council, result in his suspension from the University for a stated period, at the end of which time he may petition for readmission. The disciplinary grade of "Failure—Academic Dishonesty" will be recorded for the course involved, and this grade will be employed in the computation of the quality-point index. A student so suspended shall be withdrawn from all other courses except those in which all work has been completed.

MILITARY LEAVE

A student called to active duty may be granted military leave for the period of active duty, upon presentation to his Dean of a copy of his orders and a petition for such leave. The maintenance of "continuous registration" is not required of the student on military leave; however, he must apply for readmission to the University well in advance of the semester in which he expects to return. Payments for tuition and fees which are not refunded to the student at the time he is granted military leave will be maintained as a deferred credit for his account and use upon return to the University.

UNIVERSITY POLICY ON THE RELEASE OF STUDENT INFORMATION

In general, the policy of the University is one of attempting to keep the student's record confidential and out of the hands of those who would use it for other than legitimate reasons. At the same time, the policy must be flexible enough not to hinder the student, the University, or the community in their legitimate endeavors.

No information concerning a student will be released except as noted below:

1. Information such as whether or not the student is currently enrolled; dates of attendance; verification of date and place of birth; degrees earned, if any, date, major field or area of concentration, and honors received; home and local addresses and telephone numbers; school, college, or division of enrollment, and class; verification of signature; name and address of parent or guardian.

2. The issuance of formal transcripts of record to recognized institutions of higher learning; the certification of academic achievement to the various recognized professional associations (law, medicine, engineering, education, etc.).

Additional information will be released only on written authorization from the student, or by court order or subpoena. If a subpoena is served, the student whose record is being subpoenaed will be notified and the subpoena will be referred to the University's legal counsel.

Government investigative agencies have no inherent right to access to student files and records. If expressly requested, properly identified representatives from federal, state, or local government agencies may be given the information listed under No. 1 above.

RIGHT TO CHANGE RULES

The University and its various colleges, schools, and divisions reserve the right to modify or change requirements, rules, and fees. Such regulations shall go into force whenever the proper authorities may determine.

RIGHT TO DISMISS STUDENTS

If a student knowingly makes a false statement or conceals material information on an application for admission, registration card, or any other University document, his registration may be canceled and he will be ineligible (except by special action of the Faculty) for subsequent registration.

The right is reserved by the University to dismiss or exclude any student from the University or from any class or classes, whenever, in the interest of the student or the University, the University Administration deems it advisable to do so.

RIGHT TO MAKE CHANGES IN PROGRAMS

The right is reserved by the University to make changes in programs without notice whenever circumstances warrant such changes.

PROPERTY RESPONSIBILITY

The University is not responsible for the loss of personal property in any University building. A "Lost and Found" Office is maintained in the Campus Security Office.

RECENTLY ESTABLISHED REGULATIONS

An Appendix (pages 130-31) contains regulations recently approved by the University's Board of Trustees.

University Computer Center

THE UNIVERSITY COMPUTER CENTER is located on the first floor of Stuart Hall, 2013 G Street, N.W. The facilities of the Center are available for academic purposes to all registered students and to members of the instructional staff. The Center has as its principal mission the provision of a powerful computing system which serves the University in its educational and research endeavors. The Center's programming staff concentrates its efforts in conducting faculty and staff seminars, consulting with users in the preparation of complicated programs, and carrying out computer-oriented research.

The Computer Center equipment consists of an IBM system 360 Model 50 computer with 256,000 positions of core storage, a 2314-disk storage unit providing on-line storage for more than 200 million characters, a card read/punch, a high speed line printer, and four tape drives. The principal languages that are available are FORTRAN IV, COBOL, Programming Language One (PL/1),

Assembly Language, Report Program Generator (RPG), ALGOL, and SNOBOL 3. In addition, there are numerous utility, statistical, data manipulation, and simulation systems available in the Computer Center Library of Programs. Facilities are available on a first-come, first-served basis for preparation of programs and data.

Computer programming courses are offered by the School of Government and Business Administration, the Department of Statistics, and the School of Engineering and Applied Science. In addition, many other departments offer courses that utilize the computer as a research adjunct to course work.

The Computer Center is open 24 hours a day from 8 a.m. Monday to 4 p.m. Saturday.

Student Services

RESIDENCE HALLS

COMPLETE INFORMATION concerning the University's residence halls is available from the Housing Administrator, George Washington University, Washington, D.C. 20006. Information concerning off-campus housing near the University may be obtained at this Office. The reservation of rooms in private houses must be made by students.

Admission to the University does not include a room reservation. The student will receive, with his notification of acceptance, University residence hall information, an application for residence hall space, a medical examination form, and a declaration of intent to attend the University. The medical examination form must be completed by the applicant and his physician and returned to the University Health Services Office. The application for residence hall space must be accompanied by a \$100 *nonrefundable deposit*, which is credited toward the semester's room charge. Rooms are leased for the academic year, and payment must be made in advance of each semester.

1970-71 RESIDENCE HALL RATES PER PERSON FOR TWO SEMESTERS

Madison Hall (men): room and food service, \$1,260; room only, \$650.
Graduate Women's Residence: room \$700. Apartments in this hall have kitchen facilities; however, food service is available, if desired, at \$610.

FOOD SERVICE

Well-balanced meals are served cafeteria style five days a week (15 meals). Food service payment does not cover University holidays or vacation periods.

UNIVERSITY CENTER

The term University Center encompasses a building, an organization, and a program. The building is the University's center for community life. It is the physical instrument for implementation of the programs and objectives of the organization.

The organization, composed of students, faculty, administrators, and alumni, in the form of a three-board structure, provides an informal education medium

for individual and group activities adapted to the leisure-time interests and needs of the University community. It also provides training for those directly involved in management and programming for the Center.

The primary purpose of the George Washington University Center is the continuing development of a broad cultural, intellectual, social, and recreational program. Its secondary purpose is the provision of its various services and facilities to the campus community for the development of community life.

The Center houses a wide range of facilities to serve the needs of the campus, including dining rooms and a rathskeller, a bookstore, lounges and study areas, a theater, bowling lanes and a billiard room, a University club, student organization offices and workrooms, meeting and conference rooms, an information center, music listening rooms, social areas, shower and dressing rooms, lockers, and parking accommodations.

HEALTH SERVICES

The Health Services Staff assists students with their medical needs by advice and treatment, by proper referral when necessary, and by cooperation with other physicians. For medical emergencies and health consultations there is, on the campus, a Student Health Clinic open Monday through Friday, from 9 a.m. to 10 p.m. during the academic year and from 9 a.m. to 9 p.m. during the Summer Sessions, with physician in attendance. On Saturdays, a physician is available from 9 a.m. until 12 noon. For night and weekend emergencies, students may go to the emergency room of the University Hospital for treatment. The basic fee for this visit will be paid by the Health Services, and all other charges will be the responsibility of the student. This arrangement is for emergency care only.

Medical privileges also include hospitalization, including board and nursing, in the University Hospital for not more than one week during any twelve-month period—the necessity to be determined by the Director of Health Services.* These privileges do not include coverage for maternity or other conditions arising from a pregnancy. All additional hospital charges for operating room, anesthetics, laboratory, X-ray, medications, or any special services must be paid by the student. Expenses incurred for examinations and treatment by specialists, such as eye refraction and provision of glasses, orthopedic examinations and application of cast or other appliance, laboratory and X-ray work, and surgical operations, must be paid by the student.

These medical benefits apply only to illness or disability incurred while currently enrolled in the University. They do not apply to illness or disability incurred between the last day of examinations for a semester or summer session and completion of registration for the next semester or summer session.

The student may, if he so desires, engage physicians and nurses of his own choice, but when he does so he will be responsible for the fees charged.

Rules: (1) the Director of Health Services is empowered to limit or deny the medical benefits when, in his discretion, a student has, by his misconduct or breach of the rules of the University, made himself ineligible; (2) the Director of Health Services has authority to determine the necessity and length of hospitalization; (3) a student not currently enrolled or one who has severed his connection with the University is ineligible for medical benefits; (4) the hos-

* See rule (4) for exception.

pitalization privilege provided by the University is not available to those students covered by any other type of hospitalization.

The University is not responsible for injuries received in intercollegiate or intramural games, or in any of the activities of the Department of Physical Education.

HEALTH AND ACCIDENT INSURANCE

In addition to the above services, the Health Services Staff has arranged for Health and Accident Insurance, on an elective basis, for full-time students. Arrangements for insurance coverage are the responsibility of the student. The University assists in the subscription process by administering application cards and collecting fees during official registration periods.

A student must subscribe and pay for the coverage at the time of official registration of his school or college. For those few students who register late, the subscription will be available during official late registration. *Subscription during late registration will not be available for those students who previously registered and failed to subscribe at that time.* Students who participate in the pre-registration, conducted in the spring for the following Fall Semester, must subscribe for the coverage at the time of pre-registration. The fee will be included with the tuition bill and must be paid by August 1.

The fee charged and the coverage provided are effective, whether at the University, at home, or elsewhere, on a 6-month basis—September through February for those subscribing for the fall, and March through August for those subscribing for the spring. The fee charged at each official registration period will be the payment required for full coverage for a 6-month period and must be paid in full at the time of subscription.

The policy contract is between the individual student and the insurance carrier and is accepted at any hospital or emergency room that accepts this type of medical coverage. Details of the policy are contained in a folder available at the Health Services Office.

STUDENT EMPLOYMENT

The Law Center helps in the placement of its students and maintains a placement service for that purpose. In addition, the Student and Alumni Career Services Office, Woodhull House, 2033 G Street, N.W., provides assistance to students seeking full-time, part-time, or temporary employment. This Office maintains a registry of positions available and refers qualified applicants for consideration. Information is also available on Civil Service examinations.

A student taking more than ten semester hours must limit outside employment to less than twenty hours (see "Academic Work Load," page 34). It is urged that full-time students refrain from engaging in outside employment during their first year. Although work in some special areas may contribute to the learning and experience of the student, as a general rule it will compete with time needed for adequate study and preparation, which are at the heart of a good legal education.

PLACEMENT SERVICE

The Law Center takes a continuing interest in the placement of its graduates in private practice and governmental service as well as with industry and com-

merce. The Dean, the Faculty, and the Placement Office cooperate in collecting information from alumni, law firms, and government agencies concerning opportunities in legal positions throughout the country. Senior law students and recent graduates are urged to keep in touch with the Placement Office.

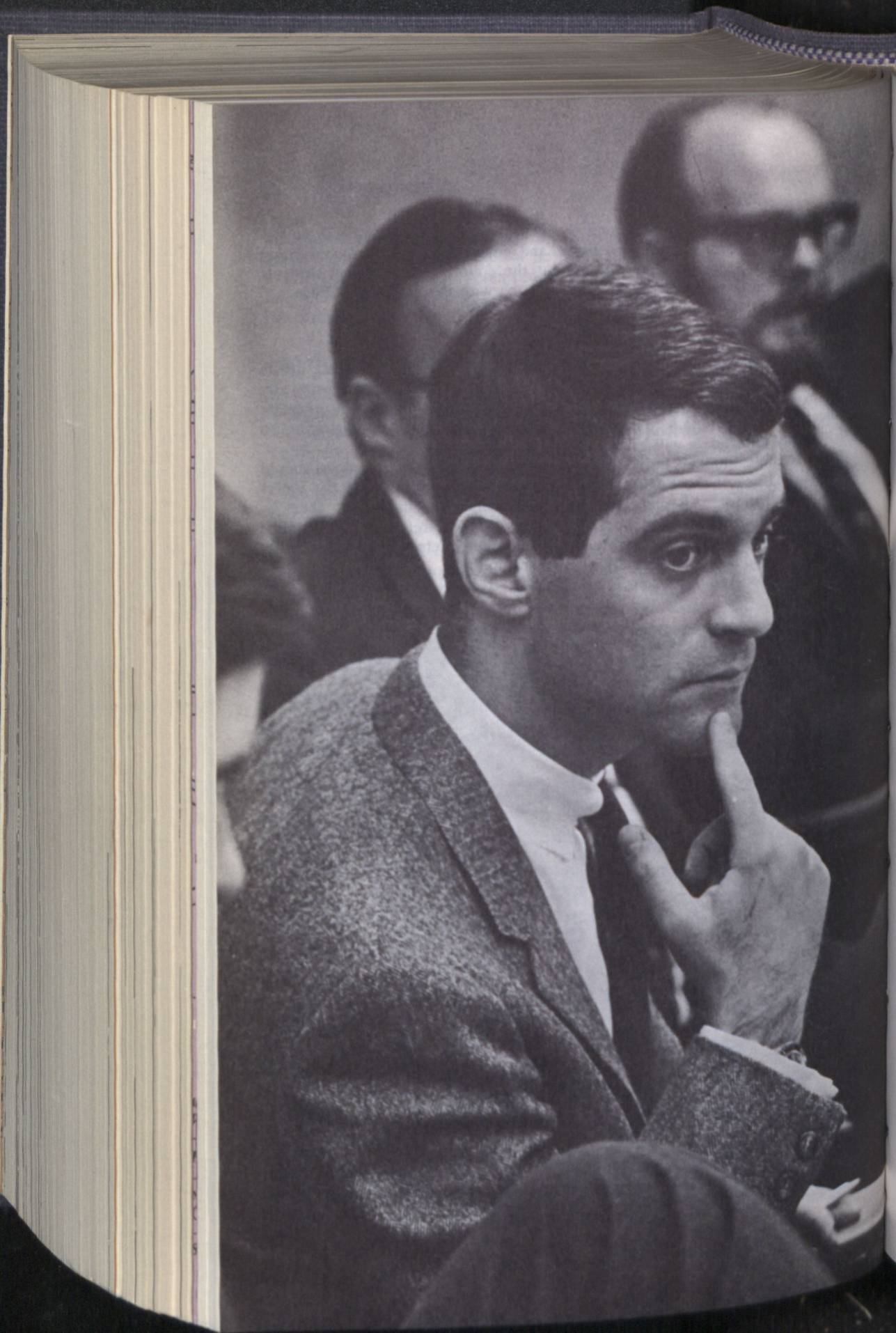
VETERANS EDUCATION

The Office of the Registrar, Luther Rice Hall, 2121 Eye Street, N.W., assists students entitled to educational benefits as veterans or war orphans with any problems which may arise concerning their benefits. This Office also processes certification of enrollment and attendance to the Veterans Administration so that monthly allowances will be paid.

When feasible, students entitled to benefits as veterans or war orphans should consult the Office of the Registrar prior to submitting application to the Veterans Administration. All such students should obtain the instruction sheet issued by the Office of the Registrar, which sets forth requirements to be fulfilled before certification of enrollment can be made to the Veterans Administration, and which includes other information of general interest.

The Veterans Administration is at 2033 M Street, N.W., Washington, D.C. 20421.





COURSES OF INSTRUCTION

THE COURSES OF INSTRUCTION listed below are subject to change. The University reserves the right to withdraw any course announced.

The number of hours of credit given for the satisfactory completion of a course is indicated in parentheses after the name of the course. Thus, a year course giving two hours of credit each semester is marked (2-2), and a semester course giving two hours of credit is marked (2).

In most courses, a final examination is held during the examination period, and the grade in the course is determined in large part by that examination. These courses are parenthetically marked "Examination."

Courses that require the preparation of a major research paper in lieu of an examination are parenthetically marked "Research Paper." The satisfactory completion of such a paper by a student individually will satisfy the Legal Writing curriculum requirement for the J.D. degree.

Courses parenthetically marked "Problem Assignments," "Writing Assignments," "Take-home Examination," or "Choice of Paper or Examination" indicate the nature of the method planned by the instructor for determining in major part the grade he will give for the course. A course marked with any of these designations will not satisfy the Legal Writing curriculum requirement for the J.D. degree.

Day classes begin at 9:10 a.m. and run throughout the entire morning and afternoon. Evening classes begin at 5:50 p.m. Many examinations for both day and evening classes may be given in the afternoon only. Examinations for day students may be held in the evening only.

A parenthetical designation at the end of a course description indicates whether the course is scheduled to be offered in the spring or fall semester or in the summer sessions, and also usually whether it will meet in the day or evening. When a double-numbered course is designated "Academic year," the first half of the course is scheduled to be offered in the fall, the second half in the spring. Courses with no parenthetical designation indicating time of offering are not scheduled to be given during the 1970 summer sessions or the 1970-71 academic year.

COURSES FOR JURIS DOCTOR CANDIDATES

Required courses are numbered from 201 to 300. Courses numbered from 301 to 400 are normally taken by second- and third-year students. Courses numbered from 401 to 600 are generally more advanced. Second-year students may take courses numbered above 400 only with the permission of the Dean. Third-year students are encouraged to take one course numbered above 400 each semester, and may take more than one such course with the permission of the Dean.

REQUIRED COURSES

203-4 Contracts I-II (4-2)

Nash, Freedman, Cibinic, Pock, Ginsburg

Legal remedies of contracting parties, including damages in contract and quasi-contract, specific performance, reformation, rescission, remedies in tort; acts creating and terminating contractual rights, including offer and acceptance, mistake, problems of proof; function of consideration; conditions; assignments; third-party beneficiaries; effect of changed circumstances; protection of the client's interests upon breach or threat of breach by the other party. Emphasis on problems of analysis, draftsmanship, adversary method. (Examination) (Academic year—day and evening)

207 Torts (4)

Merrifield, Seidelson, Park, Banzhaf

Liability for harm to person or property. Intentional torts, negligence, nuisance, products liability, misrepresentation, defamation, and invasion of privacy; fault and other basis for shifting losses; causation; damages; effects of liability insurance; problems under Federal Tort Claims Act. (Examination) (Fall—day and evening)

211 Property (4)

Starrs, Schiller, J. Brown

Basic concepts of personal property. Real property: historical background of the law of estates and conveyancing, types of estates, dower and curtesy, landlord and tenant relationship, concurrent estates, future interests at common law and after the Statute of Uses; introduction to modern conveyancing—the real estate contract, the deed, the recording system, methods of title assurance. (Examination) (Fall—evening; spring—day; summer 1970)

212 Constitutional Law (4)

Dixon, Miller, H. Green, Barron

Basic principles of American constitutionalism; judicial function in constitutional cases; implementation of doctrines of separation of powers, federalism, limited government; development and exercise of national powers; introduction to civil rights and liberties. (Examination) (Spring—day and evening)

215 Criminal Law and Procedure (4)

Starrs, Allen, Robinson

Origin and purposes of criminal law; elements of criminal liability; mental disorders; crimes against the person, property, and against both; statutory offenses; criminal procedure, with consideration of Federal Rules of Criminal Procedure. (Examination) (Fall—day; spring—evening)

218 Civil Procedure (4)

Sharpe, Barron, Park, Ferster

Mechanics of litigation—rules which govern the process by which rights and duties studied in substantive law courses are enforced; pleadings, discovery, pre- and post-trial motions, jurisdiction and venue, equity jurisdiction and trial by jury, former adjudication. Emphasis on Federal Rules of Civil Procedure, but principles and main problems indigenous to all procedural systems are developed. (Examination) (Spring—day and evening)

220 Legal Research and Writing (2)

Seidelson and Staff

Introduction to and practical experience in the use of a law library; instruction and practice in legal writing, including a memorandum and appellate court brief; instruction and experience in the preparation and argument of an appellate court case. The grade CR (credit) or NC (no credit) is given for this course. (Fall—day and evening)

- 232 **Evidence** (4) Seidelson, Robinson
Preparation and presentation of evidence, including proof of writings; qualification and examination of witnesses with emphasis on impeachment; privilege; opinion testimony; determination of relevancy; demonstrative, experimental, scientific evidence; application of the hearsay rule. (Examination) (Spring—day and evening; summer 1970)

ELECTIVE COURSES

- 302 **Admiralty** (2) Sharpe
Doctrines originating in admiralty courts—prize, maritime liens, salvage, general average, negligence in ship collisions and otherwise, maintenance and care, unseaworthiness; maritime law from legislative origins—personal injury and death remedies, limits on shipowners' liability, regulation of carriage of goods and persons; admiralty jurisdiction and maritime law in the federal system. (Examination) (Fall—day)
- 303 **International Law and World Order** (3) Mallison
Traditional content of introductory course in international law presented in context of values and institutions of world community; emphasis upon national states as participants in decision-making processes with consideration also of individuals, international public organizations, political parties, pressure groups, private associations; analysis of range of available sanctions; roles and effects of international agreements under United States Constitution; introduction to the law of war. Complements but does not repeat material in Law 391. (Examination) (Fall—day and evening; summer 1970)
- 307 **Comparative Law** (3) Albert
Civil Law System, general introduction to foreign law as exemplified by Roman Law and French and German Civil Codes, comparative study of administration of justice and legal institutions. Delictual and contractual obligations. (Examination and Writing Assignments) (Spring—day)
- 309 **Conflict of Laws** (3) Dixon, Seidelson
Legal problems arising from occurrences transcending state or national boundaries; jurisdiction; foreign judgments; constitutional influences; theoretical bases of choice of law principles and their application to specific fields, including torts, contracts, property, family law, administration of estates, business associations. (Examination) (Fall—day and evening; summer 1970)
- 311 **Business Associations I** (2) Sharpe, Potts, Schiller, Carlson
Legal principles concerning association in business by agency, partnership, other unincorporated forms, and corporations; creation, form and nature of agency, partnership and corporation; basic principles of agency and partnership and introductory related principles of corporation law. (Examination) (Fall—day and evening; summer 1970)
- 312 **Business Associations II** (4) Kirkpatrick, Carlson, H. Green
Corporate law, with emphasis on operations and financing of corporations. Control of corporations, action by corporate directors, officers, shareholders. Control devices. Directors' and shareholders' duties of care and loyalty, insiders' transactions in shares of the corporation. Derivative suits, kinds of shares, dividends, corporate distributions. (Examination) (Spring—day and evening)

- 313 Sales and Sales Financing (2)** Albert, Rothschild, Ginsburg
Provisions of the Uniform Commercial Code relating to sale and distribution of goods, including bulk transfers, warehouse receipts, bills of lading, and other documents of title; particular attention to secured transactions and financing devices utilized in this connection. (Examination) (Fall—day and evening)
- 314 Commercial Paper, Check Collection, and Banking (2)** Albert, Rothschild
Classic view of negotiable instruments as codified by Article III of the Uniform Commercial Code. Check collection: the system in theory as expressed in Article IV of the Uniform Commercial Code and the system in practice; Federal Reserve regulations, Clearing House agreements, and automation systems. The dual banking system, work of the Comptroller General and the Federal Reserve Board. Legal problems concerning interest and the checkless society. (Examination) (Spring—day and evening; summer 1970)
- 318 Creditors' Rights (3)** Kirkpatrick
Creditors' remedies outside bankruptcy—compositions, agreements, general assignments; bankruptcy proceedings under the federal statute, administration, discharge, the position and powers of the trustee, preferences; corporate reorganization under Chapter X of the Bankruptcy Act. (Examination) (Fall—day and evening)
- 321-22 Current Decisions (2-2)**
Limited to members of the student staff of the *Law Review*. A maximum of 4 semester hours of credit may be earned in these courses: Law 321-22 and Law 346. The grade CR (credit) or NC (no credit) is given for this course. (Academic year—day and evening)
- 325-26 Trusts and Estates I-II (3-3)** Weaver, Kuhn, Muys
Noncommercial transfers of wealth at death or during life. Law 325: essential elements and formalities for creation of trusts and execution of wills, revocation and alteration, grounds for contest, limits on property owner's power to control, intestate succession. Law 326: dispositive provisions, common questions of construction, future interests problems, administration of estates and trusts, charitable trusts. Prerequisite to Law 325: Law 210 or 211; to Law 326: Law 325. Weaver—(Examination and Writing Assignments); Kuhn—(Examination) (Academic year—day and evening; summer 1970—Law 325)
- 327 Modern Real Estate Transactions (2)** Schiller, J. Brown
(Formerly Property II)
Advanced problems in conveyancing; private control of land use—easements, covenants, equitable servitudes; planning and zoning—the forms of zoning, appraising the purposes of zoning ordinances, municipal authority to zone against the will of other governments, due process in zoning matters, nonconforming uses. (Spring—day and evening; summer 1970)
- 329 Unfair Trade Practices (3)** Weston, Banzhaf
Unfair trade practices at common law and under statutes; trademarks, trade names; copyright law; misappropriation of ideas; protection of competitors and consumers against false advertising under Federal Trade Commission Act; resale price maintenance under state Fair Trade Acts; state

sales-below-cost statutes; Robinson-Patman Price Discrimination Act; miscellaneous business practices. Weston—(Examination) (Fall—day and evening)

330 Federal Antitrust Laws (3)

Weston, Kirkpatrick

Sherman and Clayton Acts, related statutes. Price fixing agreements and other types of trade restraints considered under Section 1; monopolizing considered under Section 2 of the Sherman Act. Mergers and tie-in sales; other activities under the Clayton Act. All types of business conduct raising questions under the antitrust laws, including trade association activities, exclusive-dealing arrangements, boycotts, patents and copyrights. (Examination) (Spring—day and evening; summer 1970)

332 Federal Jurisdiction (2)

Sharpe, Barron, Albert, D. Green

Relationship of federal courts to Congress and to the states, through analysis of cases dealing with federal judicial functions (including problems of advisory opinions, standing to litigate, justiciability), federal questions in federal courts, federal review of state court decisions (including relation between state and federal substantive law, procedural problems in exercising review, application of law to fact). (Examination) (Fall—day; spring—evening; summer 1970)

334 Advanced Criminal Procedure (2)

Starrs, Robinson

Decision to arrest, prosecutive discretion, bail, the preliminary hearing, right to a speedy trial, discovery, plea bargaining, publicity, post-conviction procedures. Starrs—(Examination and Problem Assignments); Robinson—(Examination) (Fall—day and evening)

335 Jurisprudence (2)

Mayo, Kramer

Basic jurisprudential concepts; nature of law; development of legal institutions; jurisprudential schools—natural law, analytical, historical, sociological, functional; law and logic; law and justice; the judicial process; legislative, executive, administrative decision making; impact of politics, economics, and scientific advance on legal systems; contemporary trends in jurisprudential thought, Mayo—(Examination); Kramer—(Writing Assignments) (Fall—evening; spring—day)

336 Taxation—Federal Income (3)

Weaver, Hambrick

Survey of substantive provisions of federal income tax law, including concept of gross income, provisions affecting taxation of family and individual transactions, limitations on allowable deductions, sales and dispositions of property, problems of capital gains taxation, nontaxable exchanges. Weaver—(Examination and Problem Assignments); Hambrick—(Examination) (Fall—day and evening; summer 1970)

338 Taxation—Federal Estate and Gift (2)

Kramer, Hambrick

Survey of substantive provisions of federal estate and gift tax laws, including inter vivos transfers, transfers in contemplation of death, joint interests, life insurance proceeds, property subject to powers of appointment, marital deduction and split gifts; tax procedure. (Examination) (Fall—day and evening)

339 Collective Bargaining and Labor Arbitration (2)

Merrifield, Rothschild

Collective labor agreement: content, negotiation, administration through grievance procedure and arbitration; problems in settlement of labor disputes. Rothschild—(Problem Assignments) (Spring—day; summer 1970—Law 339 (3))

340 Taxation—Federal Income, Corporations and Shareholders (3)

Hambrick, Weaver, Tannenwald, Tucker

Continuation of Law 336. Primary emphasis on corporate-shareholder relationships. Problems of corporate dividends, redemptions of stock, distributions in partial and complete liquidation, stock dividends, bail-outs, and dividends in kind closely analyzed. Federal income tax problems involved in the formation of corporations, the sale of corporate businesses (including collapsible corporations), mergers and acquisitions, and corporate divisions. Students cannot receive credit for both Law 340 and former Law 337. Prerequisite: Law 336. Hambrick, Tannenwald, Tucker—(Examination); Weaver—(Examination and Problem Assignments) (Spring—day and evening)

341 Labor Law (3)

Merrifield, Albert, Rothschild

Law governing labor-management relations, organizations and representation of employees, regulation of economic weapons, enforcement of collective bargaining agreements, interunion and intra-union relations. (Examination) (Fall—day; spring—evening; summer 1970)

344 Legal Writing (1 or 2)

Staff

Preparation of a research paper under the supervision of a member of the Faculty who will determine, prior to registration, whether the work required for the topic selected justifies one or two semester hours of credit. If elected for one hour of credit, this course may be repeated to meet the legal writing requirement for the degree. Approval of the Dean is required prior to registration. (Research Paper) (Fall and spring—as arranged)

346 Credit Activities (1 or 2)

Staff

Work done in connection with the Legal Aid Bureau, the Law Students Civil Rights Research Council, the International Law Journal, or the Moot Court Competition; under the supervision of the faculty adviser, who will determine, prior to registration, whether the work required justifies one or two semester hours of credit. May be repeated for credit not to exceed 4 semester hours. No more than 2 semester hours may be taken in any one activity. Students registering for Law 346 who have taken or plan to take Law 399 are reminded that in these courses—Law 346, Law 399, and Law 459—a maximum of 10 semester hours of credit may be earned. A maximum of 4 semester hours of credit may be earned in these courses—Law 321-22 and Law 346. The grade CR (credit) or NC (no credit) is given for this course. (Fall and spring)

347 Insurance (2)

Schiller, Pock

A primary risk distributing medium and the rules by which legislative, administrative, judicial bodies seek to promote its benefits and avert its dangers. Includes insurance marketing, insurable interest, subrogation, transfer of insurance benefits to nonpolicyholders, coverage and other insurance policy provisions, disposition of claims. (Examination) (Fall—day and evening; summer 1970)

348 Domestic Relations (2)

Seidelson, Potts, Ferster

Marriage, annulment, and divorce; adoption and custody of children; economic relations. Seidelson, Potts—(Examination); Ferster—(Problem Assignments) (Spring—day and evening; summer 1970)

349 Local Government Law (2)

Nutting, Pock

Decision-making processes in metropolitan and local communities; types and objectives of city, county, special function local government units; intergovernmental relations; original organization and changes; personnel; local lawmaking; responsibility in tort; introduction to community planning. (Examination) (Fall—evening; spring—day; summer 1970)

351 Law and Accounting (2)

Cibinic, Ginsberg

Study of fundamental accounting principles with emphasis on corporation accounting; legal and accounting implications of specific items in financial statements of corporations; inventory adjustments; corporate transactions, distributions, capital adjustments. Strongly recommended for students who have had no accounting. (Examination and Problem Assignments) (Fall—evening; spring—day)

355 Government Contracts (2)

Cibinic

Survey of basic law underlying government procurement, basic power and limitations on federal government in entering into contracts, administrative and legislative policies governing these contracts, advertised and negotiated procurement procedures, forms of contracts and clauses used. Law 431 *Government Procurement Law* is the substantial equivalent of this course. (Examination and Problem Assignments) (Fall—day)

360 Patent Property (4)

Kayton

For students intending to specialize in patent law; knowledge of, or experience in, patent law is not a prerequisite but is considered an important asset, and most students registering for the course will have had considerable experience in the field. This course is organized in two parts. Part I, covering more than half of the semester, concerns law of patents subsequent to issuance of patent; nature of patent as property and as a legal instrument; validity—novelty, nonobviousness, commercial success; infringement—direct and contributory, doctrine of equivalents, and file-wrapper estoppel. Substantive concepts introduced in an order approximating patentee's and infringer's cases in litigation. Part II concerns substantive and procedural law of patents leading to issuance of patent, mainly related to proceedings before the U.S. Patent Office: obtaining and preserving earliest possible patent filing date; continuing applications, res judicata, novelty, and nonobviousness requirements; substantive rules of priority of invention and related affidavit practice; nature of claims and formal defects; restriction and double patenting. Recommended but not prerequisite: Law 329, 330, 525. (Examination) (Spring—evening)

365 Patent Trial and Appellate Practice (2)

T. Brown

Practice before U.S. Court of Customs and Patent Appeals and federal courts. Credit is not given to students who have credit for Law 385. Prerequisite: Law 360 or former 359 and 362, and forty-two additional hours of Law. Prerequisite or concurrent registration: Law 218 and 232. The grade CR (credit) or NC (no credit) is given for this course. (Fall and spring—evening)

370 Selective Service Law (2)

Ginsburg

Analysis of the Selective Service Act and implementing regulations, as interpreted by the courts. Discussion of selection (including the lottery), exemptions and deferments, special problems of conscientious objectors, procedures within the Selective Service, court review, punitive reclassification, medical and psychiatric standards and procedures, legislative pro-

posals, and problems in prosecuting and defending draft cases. (Examination and Problem Assignments) (Spring—day)

372 Administrative Law (3)

Miller, Park, Banzhaf

Study of the administrative process in executive and independent regulatory agencies; emphasis on judicial review. Formal and informal decision making, investigation, planning, and public administration functions of the agencies as related to their legal limits and to the roles of lawyers in government and private practice. Relationships of agencies to the executive and legislative branches, to public and private interest groups, and to the social, political, and economic aspects of various philosophies of government regulation. Miller—(Writing Assignments); Park—(Examination and Writing Assignments) (Fall—day; spring—day and evening; summer 1970)

374 Equity (2)

Nutting, Pock, Banzhaf, D. Green

Nature of equity jurisprudence through analysis of selected problems in equity; historical development of equity, including problems of merger of law and equity; use of equity jurisdiction offensively and defensively, including multi-party actions, injunction of executive and legal actions, equitable abstention; emphasis on fashioning of equitable remedies. (Examination) (Spring—day and evening; summer 1970)

376 Restitution (2)

Nash, Sharpe

Quasi-contracts, constructive trusts, rescission, and other legal and equitable remedies for restoring property and money which unjustly enrich others at the expense of volunteers, victims of misappropriation, and parties to mistaken contracts. (Examination) (Spring—day and evening; summer 1970)

377 Legislation (2)

Nutting

Legislative process and roles of participants in the process; operation of United States Congress and state legislatures, including fact finding, organization, procedure. Statutory interpretation emphasized to provide foundation for more advanced courses. (Examination) (Fall—day and evening; summer 1970)

378 Suretyship and Mortgages (3)

Muys

Security interests in real property, their creation, transfer, enforcement, and extinguishment; the law of suretyship, especially in the context of accommodation credit, and the relationship of suretyship contracts and negotiable instruments. Creation of the surety relation, rights and duties of the parties, defenses and discharge of the surety. (Examination) (Spring—day)

380 Environmental Law (3)

Reitze

Survey of environmental law including air, water, and solid waste problems; mining law; ocean resources, public lands and river basin management. Governmental organizations—local, regional, state, federal, and international—will be examined in discussing policy formulation in environmental law. (Examination) (Fall—day)

381 Air, Water, and Solid Waste Pollution Control (3)

Reitze

Detailed study of the modern statutory pollution control programs and their related administrative organizations. Examination of local ordinances and model acts; problems of financing pollution abatement programs. (Writing Assignments and Examination) (Spring—day)

385 Trial Practice Court (2)Jackson, Edgerton, Herrick, Ryan,
Kendrick, Skinker, Stevas, Altshuler

Trial of assigned cases, trial tactics and techniques, pre-trial and court room procedures pursuant to federal rules. Credit is not given to students who have credit for Law 365. Prerequisite: forty-two semester hours, including Law 218. Prerequisite or concurrent registration: Law 232. The grade *CR* (credit) or *NC* (no credit) is given for this course. (Fall and spring—day and evening)

388 Appellate Practice and Procedure (2)

Freedman

Students participate in preparing an actual criminal case on appeal, starting with review of trial transcript and culminating with preparation of brief and oral argument before U.S. Court of Appeals for the District of Columbia Circuit or the U.S. Supreme Court. Appellate practice and procedure studied through texts; consultation with appellate judges, law clerks, and attorneys with cases pending on appeal; observation of arguments in the Supreme Court and the Court of Appeals. Admission by permission of instructor.

389 Medicine for Lawyers (2)

East

Basic rudiments of medicine as encountered in a malpractice suit, divorce case, et. al., including medical terminology which will enable the lawyer to communicate more effectively with medical specialists. (Examination) (Fall—day)

390 Forensic Medicine (2)

Sharpe, Head

A survey of interprofessional relations between physicians and lawyers in the office, the hospital, and the courtroom, with incidental attention to laboratories, legislatures, and administrative agencies. Undergraduate law students and second-year medical students study how their professions accommodate conflicts between economics and ideals, and how they exercise judgment in applying their technical skills. (Examination) (Fall—day and evening)

391 United Nations Law and World Order (2)

Mallison

Introduction to international law through study of law and practice of United Nations Charter; structure and process of decision of United Nations; maintenance of international peace and security—peaceful settlement of disputes and national and collective self-defense; formulation and implementation of human rights. Complements but does not repeat the material in Law 303. (Examination) (Spring—day and evening)

394 Women and the Law (2)

Kessler

An examination of the treatment of women in all areas of the law. Emphasis on education, public accommodations, employment, and health and welfare services. Students will choose clinical projects on which to focus the semester's work. Admission by permission of instructor. Enrollment limited to 15 students. (Research Paper) (Fall and spring—evening)

395 Legal Strategies and Federal Regulatory Problems (2)

Nader and Associates

Study of the development of legal strategies dealing with specific federal regulatory problems and administrative processes. Specific areas—banking regulations, tax regulations and rulings, antitrust, corporate subsidy or leasing, and civil servant accountability in handling a regulatory matter—will be studied for analysis and strategy formulation at the administrative

level. Two-thirds of the course will be devoted to analyzing the complexities of these areas, the last third to formal strategy presentations. This course is open to a limited number of third-year students. The grade *CR* (credit) or *NC* (no credit) is given for this course. (Writing Assignments) (Fall—day)

399 Clinical Law Work (arr.)

Staff

Projects involving litigation, research, or public interest activities of a legal nature (including aid to indigents, support of public interest non-profit corporations, and support of governmental agencies or courts) may be initiated and will be supervised by a faculty member. Projects must be approved in advance by the Law Center Supervisory Committee (three members) both as to whether the project is appropriate and as to the number of semester hours of credit to be granted. A maximum of 10 semester hours of credit may be taken in one or two semesters. If students elect Law 346, *Credit Activities*, or Law 459, *Problems of the Consumer*, the number of semester hours of credit they receive for these courses will be deducted from the maximum of 10 hours they can receive for Law 399. This course is open to a limited number of third-year law students. The grade *CR* (credit) or *NC* (no credit) is given for this course. (Fall and spring)

ADVANCED COURSES

ADMINISTRATIVE LAW: ECONOMIC REGULATION

Faculty Advisers: J.A. Barron, A.S. Miller, R.E. Park, G.E. Weston

402 Executive Function (2)

Miller

Executive branch in constitutional theory; major trends in development of executive-administrative function; organization of executive branch; relationship of executive to Congress and judiciary; policy-making procedures within executive branch including role of Bureau of the Budget in national policy planning; case studies in exercise of executive power in such functional areas as national defense, race relations, national economy, foreign economic relations; role of law and lawyers in executive decisional and implemental process. (Research Paper)

403 Public Economic Policy and the Law (2)

Stark

Interrelation of law and economics in such subject-matter categories and decisional contexts as antitrust laws, economic regulation of industry, fiscal policy planning, government research and development practices, land use planning, and foreign trade and investment. (Research Paper) (Fall—evening)

404 Securities Regulation (2)

H. Green, M. Cohen, Stranahan, Mathews

State and federal laws governing offering and distribution of securities to the public by corporate issuers and others, regulation of securities markets, rights and liabilities of purchasers under such statutes. Emphasis on statutes administered by Securities and Exchange Commission. (Take-home Examination) (Fall—day and evening)

405 Regulation of Securities Markets (2)

Rotberg

Operation of over-the-counter and exchange markets, including competitive and monopolistic practices in each market; relationship of antitrust laws and securities regulations to concept of a free and open market

place; role of regional exchanges and third market in providing competitive element in market; advantages and disadvantages of a fragmented market; minimum fee structure, rebates and their effect on merchandising of securities and financial soundness of industry; use and availability of economic data in evaluating performance of market place. The seminar will examine matters directly of interest to graduate law students, lawyers, economists, and political scientists. (Take-home Examination) (Spring—evening)

407 Seminar: Regulation of Transportation I (2)

Hill

History of development of modes of transportation in the United States; economic problems and growth of regulatory legislation and philosophy; the congressional power to regulate; the scope of federal regulation; division of regulatory authority between federal and state governments; introduction to principles of certification and rate-making. (Examination) (Fall—evening)

408 Seminar: Regulation of Transportation II (2)

Hill

Principles of certification of rail, motor, water, and air carriers; elements and principles of rate-making; comparison of problems, procedures, and regulatory philosophies of the various regulatory agencies. (Examination) (Spring—evening)

412 Food and Drug Law (2)

Goodrich, Kaplan, Kleinfeld

The Federal Food, Drug, and Cosmetic Act and governmental controls thereunder. Both government and industry viewpoints are considered. (Choice of Paper or Examination) (Spring—evening)

413 Public Policy and Mass Media (2)

Barron, Cohn

Institutional structure of mass media and their interrelationships; psychological aspects of mass communications; continuing adjustments among public interest goals, the economic system, and technological developments; influence of and controls exercised by government, other institutions, and private groups; conflict between freedom of speech of the media and other major community interests; the media's relationships to the interests of dissident and minority groups and the access of these groups to the media. (Choice of Paper or Examination) (Fall—day; spring—evening)

414 Regulated Industries (2)

Park

Substantive problems of business regulation in terms of natural monopolies, franchised industries, subsidized industries, and safety regulation. Aspects of administrative practice, including the large administrative proceeding, the role of intervenors, the impact of regulation upon management and market behavior, the uses and abuses of economic evidence, the role of agencies' staffs, interagency planning and regulation, and the effects of judicial and legislative review. Each student selects one industry and develops his insight in terms of that industry's firms, market structure, growth and development, trade associations, and regulatory agencies. (Research Paper) (Fall—evening)

417 Seminar: Trade Regulation (2)

Weston

Group study of current problems relating to unfair trade practices and federal antitrust laws. (Research Paper) (Spring—evening)

Master of Laws candidates in the area of Administrative Law: Economic Regulation who have not taken the following courses or their equivalent as part of

a Juris Doctor or Bachelor of Laws program should include them in their Master's program.

- 329 *Unfair Trade Practices*
- 330 *Federal Antitrust Laws*
- 372 *Administrative Law*

OTHER RELATED COURSES

- 451 *Federal Programs for Urban Poverty*
- 493 *Intergovernmental Aspects of Technological Change*
- 494 *Use and Control of Atomic Energy and Space Technology*
- 505 *Intergovernmental Relations I*
- 506 *Intergovernmental Relations II*
- 571 *Land Use Planning*

CORPORATION LAW

Faculty Adviser: C.K. Carlson

422 The Modern Corporation (2)

Analysis of the nature and role of the large business corporation in the American political economy; models of the corporation; the transnational or multinational enterprise; the concept of accountability as applied to corporate activities; reasons for the growth of large corporate enterprise; relationships of the "supercorporations" to other centers of decentralized power and to the government; the corporation as the basic planning unit of the American economy; application of the Constitution to the corporation. (Research Paper) (Fall—day)

Miller

424 Business Planning (2)

Integrated study of corporate, financial, tax, accounting, and SEC aspects of the following: organization of a small corporation; organization of a public corporation; stock dividends, recapitalization, and stock repurchases in the context of conflict between active stockholders of a close corporation and the family of a deceased active stockholder; corporate liquidations; corporate mergers and acquisitions; and divisions of corporations. Prerequisite: Law 312 and 351. Green, Carlson—(Problem Assignments); Cohen—(Writing Assignments) (Fall—day; spring—evening; summer 1970)

H. Green, Carlson, S. Cohen

427 Legal Aspects of International Business Transactions (2)

U.S. law and practice, including current tax problems and U.S. restrictions on investment; brief comparison with British and Civil Law systems; international law, international contracts, choice of law; currency considerations; effect of SEC laws and regulations; international trade, including GATT and reciprocal trade arrangements; sources of finance, both United States and foreign, private and public, including international organizations; protection of property, settlement of disputes, and selected case studies. In addition to the regular lecturers, there will be guest lecturers in various specialties. Emphasis on current problems in international trade and investment. Prerequisite: Law 303. (Choice of Paper or Examination) (Spring—evening)

Nurick, Guttentag

Master of Laws candidates in the area of Corporation Law who have not taken the following courses or their equivalent as part of a Juris Doctor or Bachelor of Laws program should include them in their Master's program.

- 312 *Business Associations II*
- 313 *Sales and Sales Financing*
- 329 *Unfair Trade Practices*
- 330 *Federal Antitrust Laws*
- 340 *Taxation—Federal Income, Corporations and Shareholders*

OTHER RELATED COURSES

- 431 *Government Procurement Law*
- 540 *Comparative Conflict of Laws and Transnational Legal Problems*
- 541 *Seminar: European Common Market*
- 555 *Taxation—Special Corporation Problems*
- 562 *Income Taxation of Foreign Business and Investment*

GOVERNMENT PROCUREMENT LAW

Faculty Advisers: John Cibinic, Jr., G.J. Ginsburg, R.C. Nash, Jr.

- 431 **Government Procurement Law (2)** McIntire

Survey of the law pertaining to government procurement, including an analysis of the unique features of government contracting and a discussion of the functions of Congress, the executive branch, and the courts in the procurement process. Law 355 *Government Contracts* is the substantial equivalent of this course. (Examination) (Fall—evening)

- 432 **Formation of Government Contracts (2)** McIntire

Detailed coverage of the rules and practices followed in arriving at contracts between the government and private parties. Comparison in depth of advertised and negotiated procurement and analysis of the techniques used in pricing and arriving at the terms of such contracts. (Examination) (Spring—evening)

- 433 **Performance of Government Contracts (2)** Nash, Cibinic

Discussion of the substantive legal problems that most frequently arise during the performance of government contracts. Interpretation of specifications and the most generally used contract clauses, and analysis of the rights of the parties when performance in accordance with the terms of the contract is not obtained. (Examination and Problem Assignments) (Spring—evening)

- 434 **Government Contract Claims and Litigation (2)** Nash, Ginsburg

Analysis of the methods which can be used by the parties to a government contract to obtain legal relief, including detailed coverage of the disputes procedure, actions for breach of contract, and forms of equitable and extraordinary relief (Examination and Writing Assignments) (Fall—evening)

- 435 **Seminar: Government Contracts (2)** Nash, Cibinic, Ginsburg

Research and discussion of selected problem areas. (Research Paper) (Summer 1970)

OTHER RELATED COURSES

- 402 *Executive Function*
 424 *Business Planning*
 427 *Legal Aspects of International Business Transactions*
 442 *Labor Standards and Equal Employment*
 494 *Use and Control of Atomic Energy and Space Technology*
 495 *Legal Protection against Technological Hazards*
 505 *Intergovernmental Relations I*
 506 *Intergovernmental Relations II*
 535 *Negotiation: Concepts and Techniques*

LABOR LAW

Faculty Advisers: J.M. Albert, L.S. Merrifield, D.P. Rothschild

- 441 **Seminar: Disability and Retirement Problems (2)** Doherty
 Study of selected problems under workmen's compensation; old age, survivors, and disability insurance; medicare; and private welfare and pension plans. (Examination) (Fall—evening)
- 442 **Labor Standards and Equal Employment (2)** Ginsburg
(Formerly Labor Standards Legislation)
 Analysis of the Fair Labor Standards Act, its scope and exemptions, employee working conditions and safety requirements; the laws establishing labor standards for Government contracts, including the Davis-Bacon Act, Walsh-Healey Act, Service Contract Act, and Work Hours Act; the role of the Department of Labor, the Comptroller General, and the contracting agencies in interpretation, administration, and enforcement of these statutes. (Examination) Spring—evening
- 443 **Labor Relations in the Federal Service (2)** Tobias
 Survey of labor relations in the federal service as governed by Executive Order 11491. Emphasis on the role of the Civil Service Commission, the Department of Labor, the Congress, and the President in the development of collective relationships between unions and the federal government. (Research Paper) (Fall—evening)
- 444 **The Individual and His Union (2)** Bartosic
(Formerly Labor Unions and Their Members)
 Study of the legal relations between unions and their members with special emphasis on the right to fair representation, the right to union membership, compulsory union membership, the imposition of discipline upon union members, reporting requirements, the conduct of internal union elections, the fiduciary duties of union officers, the imposition of trusteeships, the regulation of racketeering, and political action of unions. Prerequisite: Law 341. (Examination) (Summer 1970)
- 445 **Labor Relations in State and Local Governments (2)** Jascourt
 Analysis of the shifting and emerging legal concepts that affect the form, scope, and consequences of labor relations in schools and colleges and in municipal, county, and state governmental bodies. Survey of the varied statutory and de facto labor relations systems and their impact on the development of bilateral decision making. Examination of (1) problems caused by the concurrent existence of civil service laws and the diffusion

of governmental authority, (2) impasse resolution, and (3) strikes and other concerted activities. (Research Paper) (Spring—evening)

447 Seminar: Labor Law (2)

Merrifield

Group study of contemporary problems in labor law. (Research Paper)

449-50 Seminar: Labor Litigation (1-1)

Bartosic

Intensive study of recent Supreme Court and appellate court decisions in the area of labor law; special emphasis on the contrasting variables which influence the respective decision-making processes of the National Labor Relations Board and the courts. Particular attention to labor law cases pending before the Supreme Court for decision during the current term. Analyses of the briefs filed in pending cases; attendance at oral argument; post mortems of the arguments and decisions, with classroom participation by attorneys involved in some cases. Grades and credit for both halves of the course assigned only on completion of the second half. Prerequisite: Law 341. (Research Paper) (Academic year: every other week—evening)

Master of Laws candidates in the area of Labor Law who have not taken the following courses or their equivalent as part of a Juris Doctor or Bachelor of Laws program should include them in their Master's program.

339 *Collective Bargaining and Labor Arbitration*

341 *Labor Law*

OTHER RELATED COURSES

459 *Problems of the Consumer*

460 *Current Problems in Civil Rights*

461 *Social Welfare Legislation and Administration*

LAW AND POVERTY

Faculty Advisers: Jean Cahn, R.S. Kuhn, D.P. Rothschild, J.E. Starrs

451 Federal Programs for Urban Poverty (2)

Cahn

Study of the legislative and administrative process by which particular urban problems are converted into a grant of statutory authority, an operating program, and finally a funded project in a given city. Areas considered will be employment and job training programs such as USES and vocational education programs, the Manpower Development and Training Act, Job Corps, and Neighborhood Youth Corps, elementary and secondary education programs such as Titles I and III of the Elementary and Secondary Act; and the Community Action and Model Cities programs. (Examination) (Fall—day)

453 Community Organizations (2)

Cahn

Analysis of past efforts to create community organizations in areas of poverty; alternative forms of organization, including cooperatives, unincorporated associations, and nonprofit corporations, and the advantages and disadvantages of each; functional organizations such as community councils, tenant unions, consumer cooperatives, and credit unions; community participation in Model Cities and OEO programs; problems relating to community action, such as the status of boycotts under antitrust and common law, the Constitutional protection afforded to demonstrations, and limita-

tions imposed on community action supported by public funds. (Choice of Paper or Examination) (Spring—day)

458 Housing the Poor (2)

Starrs

An in-depth analysis of current housing problems, including three main subjects: (1) Discrimination in housing. (2) Landlord and tenant relationship, including a discussion of leases and their clauses and of the eviction process, tactical and substantive defenses to it, and affirmative avenues of redress on behalf of the tenant; public housing and building code enforcement. (3) Government programs in housing, such as Rent Supplement, Turnkey, the 1968 Housing Act, and others. (Research Paper) (Spring—evening)

459 Problems of the Consumer (2)

Rothschild

Clinical treatment of consumer protection. No classes will be held. Students will be given materials on consumer protection and will be divided into project groups for the purpose of indicating the problems of the consumer to the community by a campaign of consumer awareness. For example, the National Law Center has negotiated with a commercial TV station to put on a series of "spots" dramatizing these problems, and will also run a "consumer help center." This activity will involve three groups: (1) a group to work with the station on programming, (2) a group to run the help center, and (3) a research group to investigate the results of turning complaints over to the appropriate authority. Another group of students will dramatize problems of the consumer by teaching consumer awareness in the public school system in the District of Columbia. Students registering for Law 459 who have taken or plan to take law 399 are reminded that in these courses—Law 346, Law 399, and Law 459—a maximum of 10 semester hours of credit may be earned. The grade of CR (credit) or NC (no credit) is given for this course. (Research Paper) (Fall—day)

460 Current Problems in Civil Rights (2)

Kuhn

Uses of law in the effort to achieve racial equality of opportunity, with particular reference to education and employment. Consideration of educational opportunity primarily based on Northern city problems, including study of three alternative approaches—desegregation, compensatory education, and decentralization-community control. Fair employment under applicable federal laws and the federal contract compliance program. A research or field project of substantial scope is required in some topic related to civil rights. (Research Paper) (Spring—day)

461 Social Welfare Legislation and Administration (2)

Study of public assistance, social insurance, and medical and legal assistance programs; the socioeconomic status of welfare recipients, the psychological impact of the welfare system, and the "Welfare Rights Movement"; particular legal issues, such as "midnight searches" and the Fourth Amendment, imposition of support obligations on non-fathers through the "Man-in-the-House Rule," imposition of moral behavior standards through welfare denial, right of privacy, and Constitutional issues raised by mandatory training or work requirements. (Research Paper)

462 Family Law of the Poor (2)

Consideration of the full range of problems associated with family formation and dissolution among the urban poor and the problems of urban children and their parents: the law of marriage, annulment, divorce, and

separation as it affects the poor urban family unit; impact on the family of welfare and public housing eligibility regulations; legal problems associated with common-law marriage, illegitimacy, and meretricious relationships; scope of support obligations and sanctions imposed through welfare denial or eviction from public housing; organization of social services and their role in the solution of family problems; and the lawyer's role in family counseling. (Research Paper)

OTHER RELATED COURSES

- 441 Seminar: Disability and Retirement Problems
- 472 Administration of Criminal Justice
- 475 Law and Criminology I: Search for the Causes of Criminal Behavior
- 476 Law and Criminology II: Society's Responses to the Criminal Offender
- 477 The Police and the Community
- 560 Taxation—State and Local
- 571 Land Use Planning
- 590 Population Control and the Law
- 592 Seminar: Constitutional Law

LAW, PSYCHIATRY, AND CRIMINOLOGY

Faculty Advisers: R.C. Allen, T.F. Courtless, Jr., Elyce Ferster

472 Administration of Criminal Justice (2)

Allen

Consideration and analysis of selected advanced problems in the administration of criminal justice. The subject matter covered will vary from year to year, with concentration in areas of current interest and dynamic change (e.g., right to counsel, arrest and interrogation, search and seizure, prejudicial publicity, discovery, electronic interception, mental impairment). Emphasis will be placed on the role and professional responsibilities of prosecutor and defense counsel and on developmental trends in the law. (Examination) (Spring—evening)

475 Law and Criminology I: Search for the Causes of Criminal Behavior (2)

Courtless

Role which criminological knowledge of crime causation may play in assisting lawyers to appraise the effectiveness of various alternative social and legal devices in controlling deviant behavior. The search for factors related to criminal behavior will be developed historically, with emphasis on current causal theories developed by various disciplines. Model as well as operational penal codes, sentencing and probation practices, and specialized facilities will be analyzed in terms of their relationship to such causal theories. (Take-home Examination) (Fall—day)

476 Law and Criminology II: Society's Responses to the Criminal Offender (2)

Courtless

Study of the development and current use of society's three major approaches to the handling of offenders: punitive, mechanical, and correctional. Emphasis on society's changing responses to criminal and delinquent behavior, and research findings concerning effectiveness of these responses. Analysis of treatment strategies to facilitate communication between members of the legal profession and behavior scientists charged with effectuating these strategies. (Research Paper) (Spring—evening)

477 The Police and the Community (2)

Allen, Courtless

Analysis of the variety, prevalence, and causes of urban crime; structure of police forces and proposals for improvement; exercise of discretion, abuse, or "brutality" at the time of arrest; problems of police-community relations and the role of review boards; crimes of the urban poor (such as vagrancy, "failure to move on," and public drunkenness) and their relationship to more serious criminal activity; the poor as victims of crime, and efforts to protect them other than by police activity (e.g., compensation for victims of crime, and crime prevention through minimization of opportunity). (Writing Assignments) (Spring—day)

478 Post-conviction Dispositions—Dynamics of the Law of Criminal Corrections (2)

Barkin, Goldfarb

Study of the statutes, practice, problems, and potentials of the alternatives facing a defendant including: mental fitness to proceed to trial, probation, sentencing, parole, correctional institutions, rights of prisoners. (Examination) (Fall—evening; spring—day)

486 Seminar: Law and Psychiatry (2)

Allen

Designed to (1) expose the lawyer to some of the constructs of dynamic psychiatry dealing with human personality and behavior, and to relate them to problems encountered in legal practice; (2) provide information—both psychiatric and legal—bearing upon such topics as mental illness and tort liability ("traumatic neurosis," malpractice, commission of torts by mentally ill persons); hospitalization of the mentally ill and mentally retarded; guardianship; ad hoc determinations of incompetency (testamentary, contractual, and donative capacity; capacity to marry, have custody of children; mental illness as a ground for divorce; eugenic sterilization); mental illness and the criminal law (psychiatric evaluations in criminal cases, determinations of competency to stand trial, criminal responsibility); and (3) examine the role of psychiatry in legal settings, including the effective use of the psychiatrist and psychologist as expert witness. (Research Paper) (Fall—day)

487 Interdisciplinary Seminar on the Juvenile Court (2)

Ferster

Sociological, psychological, and psychiatric views on prevention, diagnosis, and treatment; analysis of statutes, court rules, and reported cases pertaining to delinquency, dependency, custody, and child abuse; emphasis on the role of the lawyer in juvenile courts. (Research Paper) (Fall—evening)

OTHER RELATED COURSES389 *Medicine for Lawyers*390 *Forensic Medicine*591 *Legislative Drafting*592 *Seminar: Constitutional Law***LAW, SCIENCE, AND TECHNOLOGY**

Faculty Adviser: H.P. Green

491 Science Policy Formulation (2)

Anderson

Current or recent important governmental decisions in the area of science as they affect the interplay of various government and community inter-

ests; the role of law as a constraint, vehicle, or implement; the role of lawyers in the decision-making process. (Research Paper) (Fall—evening)

492 **Seminar: Science and the Legal Process (2)** H. Green

Reciprocal relationships between law and science; absorption of scientific concepts into substantive law through adjudication, legislation, and rule making; techniques and procedures used in handling, developing, and deciding scientific issues. (Research Paper) (Fall—evening)

493 **Intergovernmental Aspects of Technological Change (2)** Oppenheimer

Role of technology in breaking down political barriers and leading to intergovernmental measures to control or advance technological progress within the United States and on an international basis. Specific legal devices and institutions employed in intergovernmental handling of technological problems. (Research Paper)

494 **Use and Control of Atomic Energy and Space Technology (2)** H. Green

Problems resulting from revolutionary scientific developments of recent years. Impact of advanced technologies on the law and legal institutions. Laws and regulations relating to atomic energy and space including civilian uses, licensing, security, international, and patent considerations. (Research Paper)

495 **Legal Protection against Technological Hazards (2)** Dembling, J. Brown

The growth and development of law and legal institutions to protect society against the hazards inherent in new technologies with particular emphasis on the progress of reconciling the protection of the public with the desire for rapid progress. (Research Paper) (Spring—day and evening)

OTHER RELATED COURSES

- 380 *Environmental Law*
- 381 *Air, Water, and Solid Waste Pollution Control*
- 402 *Executive Function*
- 412 *Food and Drug Law*
- 413 *Public Policy and Mass Media*
- 431 *Government Procurement Law*
- 503 *Natural Resources Law and Policy*
- 505 *Intergovernmental Relations I*
- 531 *International Law of Air and Space*
- 532 *International Law of the Sea*

NATURAL RESOURCES LAW

501 **Land Development Law (3)** J. Brown

Study of the various techniques relative to land development; the status of the federal government as landlord, vendor, and purchaser; the competitive private market as a form of planning in comparison to governmental planning programs; the functions of the lawyer in the modern real estate transaction involving land acquisition, licenses, codes and permits,

development, construction, sale, and financing. Consideration of new forms and concepts of ownership, transportation programs as a part of land development planning, the migration of people and industry as a planning and control factor, and private and public "new town" developments. (Take-home Examination and Problem Assignments) (Fall—day; summer 1970)

502 Water Resources Law (3)

Introductory survey course in the law relating to water resources. History and development of water rights systems in the United States using a comparative analysis of Eastern and Western water law doctrines, the trends toward their modification, and study of the increasing influence of federal laws and projects. Consideration of private and public rights to both consumptive and nonconsumptive uses; analysis of pollution and other water quality problems and their interrelationships with the total demand for water and other natural resources. Identification of federal-state-local relationships, conflicts, and institutions; consideration of river-basin management and interbasin transfers; description of proposed creation of new sources. (Choice of Paper or Examination) (Summer 1970)

503 Natural Resources Law and Policy (2)

Kratchman

Study of key legal doctrines and their development in the law of water, mining, and oil. Systematic analysis of natural resource problems such as government and private interactions, multiple use and priorities of resources, and security of property rights. Examination of alternatives in resource policy development, and impact on private and public actions. (Research Paper) (Fall—evening)

504 Formulation of Natural Resources Policy (2)

Study of the way natural resources policy has been formulated; emphasis on engineering considerations, political aspects, and the social and economic forces bearing on this problem. Extensive consideration of the ongoing legislative process at the federal level; detailed examination of a number of actual problem areas, including Appalachia, the estuaries, watershed transferrals, demonstration cities, etc. (Research Paper)

Nash

505 Intergovernmental Relations I (2)

Study of federalism, emphasizing current techniques for achieving cooperation and coordination between federal, state, and local governments. Detailed consideration of devices used, including interstate compacts, grants-in-aid, and exercise of regulatory powers. (Writing Assignments and Take-home Examination) (Fall—day)

Nash

506 Intergovernmental Relations II (2)

Advanced seminar on multi-government activities; emphasis on techniques being used to implement current governmental programs. (Research Paper) (Spring—day)

OTHER RELATED COURSES

380 *Environmental Law*

381 *Air, Water and Solid Waste Pollution Control*

403 *Public Economic Policy and the Law*

431 *Government Procurement Law*

491 *Science Policy Formulation*

492 *Seminar: Science and the Legal Process*

495 *Legal Protection against Technological Hazards*

532 *International Law of the Sea*

560 *Taxation—State and Local*

571 *Land Use Planning*

591 *Legislative Drafting*

PATENT AND TRADE REGULATION LAW

521 *International and Comparative Patent Law* (2)

Federico

Origin of patent laws. Patent systems of major countries—United Kingdom, France, Germany, USSR, and others. Comparative topical survey: kinds of patents, inventors and applicants, subject matter, novelty, administrative procedures, oppositions, revocation, renewal fees, compulsory licensing infringement, etc. International Convention for the Protection of Industrial Property: origin, membership, organization, substantive provisions. Treaties in the making, Common Market patent system, Nordic Patent, Patent Cooperation Treaty, Council of Europe activities. (Take-home Examination) (Spring—evening)

523 *Court Review of Patent Office Decisions* (2)

Dunner

Procedure and procedural law involved in appealing to the U.S. Court of Customs and Patent Appeals and the U.S. District Courts from administrative decision in the U.S. Patent Office. Designed to provide an exhaustive step-by-step procedural progression through *ex parte* and *inter partes* appeals. Emphasis on the forms used in the many motions and proceedings before the Court of Customs and Patent Appeals and the District Courts required to perfect an appeal. Introductory material will include administrative appeals before the U.S. Patent Office Board of Appeals. Special extraordinary review in the U.S. District Courts and under the Administrative Procedure Act. Prerequisite: Law 360 or the equivalent in experience. (Examination) (Fall—evening)

525 *Copyright Law* (2)

Cary

Historical background; formalities and essentials in securing a copyright; subject matter of copyright; remedies; international aspects of copyright under Berne Union, Universal Copyright Convention, Inter-American Convention; copyright licensing and performing rights societies. (Examination) (Fall—evening)

527 *Advanced Topics in Patent Law* (2)

Harris

Multidisciplinary consideration in depth of current industrial-intellectual property problems; licensing and protection of industrial property; uses and abuses of patents; governmental regulation; protection and transactions abroad; international treaties and arrangements; role of patents, trademarks, and trade secrets in business; economic and social functions of patents, trademarks, and copyrights. Students are exposed to pertinent source materials, professional research methods and techniques, firsthand reports by specialists and examples of work sponsored by the PTC Research Institute. Opportunity for oral presentation and discussion of term papers prior to submission is provided to encourage instructional dialogue among students and the investigation and analysis of issues. Prerequisite: Law 360. (Research Paper) (Spring—evening)

529 *Research in Patent, Trademark, and Copyright Law* (2)

Harris

Prerequisite: Law 417, 527, and related courses; and a B average. Request in writing, with proposed outline of topic of research, must be submitted

to the Dean at least one month prior to registration day. Work must be completed within the semester and paper submitted not later than last day of classes. Graduate students may repeat this course once for credit with the approval of the Dean. (Research Paper) (Fall and spring)

Master of Laws candidates in the area of Patent and Trade Regulation Law who have not taken the following courses or their equivalent as part of a Juris Doctor or Bachelor of Laws program should include them in their Master's program.

329 *Unfair Trade Practices*

330 *Federal Antitrust Laws*

360 *Patent Property*

OTHER RELATED COURSES

412 *Food and Drug Law*

417 *Seminar: Trade Regulation*

427 *Legal Aspects of International Business Transactions*

431 *Government Procurement Law*

491 *Science Policy Formulation*

492 *Seminar: Science and the Legal Process*

493 *Intergovernmental Aspects of Technological Change*

541 *Seminar: European Common Market*

562 *Income Taxation of Foreign Business and Investment*

PUBLIC INTERNATIONAL LAW AND COMPARATIVE LAW

Faculty Adviser: W.T. Mallison, Jr.

531 *International Law of Air and Space (2)*

Dembling

Study of the development of international law relating to the use of air space and outer space; analysis of air and space treaties in force; the role of various intergovernmental and nongovernmental international organizations; consideration of special problems such as liability resulting from space activities, space technology and arms control, and pollution and contamination of outer space; earth resources, sensing, etc. (Research Paper) (Fall—evening)

532 *International Law of the Sea (2)*

Muys

International and domestic law affecting the allocation of authority over ocean space. Problems concerning internal waters, territorial seas, the high seas, contiguous zones, and the continental shelf; the impact of advances in ocean science technology on ocean resource law; freedom of the sea, maritime safety, and related subjects. (Research Paper) (Spring—evening)

533 *Legal Regulation of International Coercion (2)*

Mallison

Process of legal decision during war and at times when expectations of violence are high—contemporary international law of war and coercive measures short of war, such as limited naval blockade; legal aspects of modern methods of coercion—economic, political, psychological, and military; limited war and modes of preventing "escalation" to total war; regulation of hostilities; problems concerning atomic, bacteriological, and chemical weapons. (Research Paper) (Fall—evening)

535 **Negotiation: Concepts and Techniques (2)**

Ramundo, Baruch

Role of the lawyer and policy maker (client) in private, intragovernmental, and international negotiations; negotiations in private practice and governmental operations; achievement of consensus among contentious parties; negotiating techniques, including effective use of the "fallback"; gaming exercises in the actual conducting of negotiations, with practical work in the preparation of claim letters, agency and national positions, and negotiating instructions. (Research Paper) (Spring—evening; summer 1970)

536 **Diplomatic and Consular Law and Practice (1)**

Mitchell

Development of diplomatic and consular relations between nations; legal rights, privileges, functions, and immunities of diplomatic and consular personnel; extent of immunity from jurisdiction of foreign government missions and representatives; problems of taxation affecting foreign government missions and personnel. (Research Paper)

540 **Comparative Conflict of Laws and Transnational Legal Problems (2)**

Delaume

(Formerly Comparative Conflict of Laws and Transnational Problems)

Adjudicatory jurisdiction, recognition and enforcement of foreign judgments in England and the Common Market countries; choice of forum clauses; transnational commercial arbitration; the Convention on the Settlement of Investment Disputes between States and Nationals of Other States; sovereign immunity; international judicial assistance; proof of foreign law; transnational contracts and stipulations of applicable law. Prerequisite: Law 309. (Research Paper) (Spring—evening)

541 **Seminar: European Common Market (2)**

Ehrenhaft

Analysis of treaty establishing European Economic Community; institutions of EEC and of member states and the internal law of member states as they affect doing business in EEC; series of problems arising out of establishing and operating business with and within EEC. Background in international law and antitrust law desirable. (Problem Assignments) (Fall—evening)

542 **Seminar: International Technical and Economic Assistance (2)**

Aufrecht

Technical and economic assistance activities of the United States, the United Nations, and specialized agencies; problems of law, policy, program, and administration; development planning; public and private transactions and institutions involving technical or economic assistance. (Research Paper) (Fall—evening)

546 **Soviet Law (2)**

Ramundo

Concept of "socialist legality"; legal relationship of individual to state and other participants in Soviet society; role of Party in Soviet legal system; Soviet philosophy of law; state (constitutional) law: Soviet federalism, governmental apparatus, rights and obligations of citizenship; criminal law; property law; labor law; selected topics in civil law and procedure; international law. (Choice of Paper or Examination) (Fall—evening)

547 **Chinese Law (2)**

Hsia

Emphasis on the legal system of Communist China; analysis of the constitutional law of the People's Republic of China, including general principles, state structure, and rights and duties of citizens; a brief survey of

the administration of justice—courts, procuratorates, and lawyers; marriage law; land law; counterrevolutionary act and other criminal statutes; principles of civil law; Communist Chinese concept of international law. (Research Paper)

548 Law of the Near East (2)

Liebesny

Law of the Arab countries, Turkey, and Iran, including basic principles of Islamic law, analysis of the present day codes, and investigation of the Western influences on laws of these countries. (Examination) (Spring—evening)

Master of Laws candidates in the area of Public International and Comparative Law who have not taken the following courses or their equivalent as part of a Juris Doctor or Bachelor of Laws program should include them in their Master's program.

302 Admiralty

303 International Law and World Order

307 Comparative Law

309 Conflict of Laws

391 United Nations Law and World Order

OTHER RELATED COURSES

427 Legal Aspects of International Business Transactions

494 Use and Control of Atomic Energy and Space Technology

505 Intergovernmental Relations I

506 Intergovernmental Relations II

521 International and Comparative Patent Law

562 Income Taxation of Foreign Business and Investment

TAXATION

Faculty Advisers: J.R. Hambrick, D.B. Weaver

551 Taxation—Partnerships and Subchapter S (2)

Income tax problems of partnerships and tax-option corporations (Subchapters K and S of the Internal Revenue Code of 1954). Prerequisite: Law 336. (Examination) (Spring—evening)

Speiller

553 Seminar: Estate Planning (2)

Study of the effective disposition of wealth by inter vivos gift and testamentary transfer; emphasis on income, estate, and gift tax considerations; use of the trust form in the transfer of wealth; use of insurance and jointly held property as part of the estate plan; planning for the continuation or disposition of the client's business interests. Preparation of an estate plan, with supporting documents is the major project for the course. Prerequisite: Law 338. (Research Paper) (Spring—evening; summer 1970)

555 Taxation—Special Corporation Problems (2)

Schoeneman

Detailed study of the principal federal tax benefits of the corporate form of doing business. Consideration of problems involved in the tax planning of the corporate structure and corporate operation, including the tax definition of a corporation, the special deductions available to corporate tax-

payers, the compensation of the corporate executive and employee, the debt-equity question, the accumulated earnings tax, the personal holding company tax, multiple corporations, and consolidated returns. Survey of the types of corporations receiving special treatment under the Internal Revenue Code, such as financial institutions, real estate investment trusts, regulated investment companies, cooperatives, and small business corporations. (Research Paper) (Fall—evening)

557 Taxation—Exempt Organizations (2)

Treusch

Tax exempt organizations—policy and practice. Preferred tax treatment of selected organizations and of gifts to them. Statutes and regulations vs. actual IRS practice; legislative origins, judicial interpretations, and policy considerations. Tests of qualification, disqualification, and limited tax preference. Mechanics of securing and retaining exemptions, qualified exemption, unrelated business income vs. investment income. Denial or loss of exemption; tax treatment of nonexempt, nonprofit organizations. Judicial and legislative treatment of losses of tax exempt status and other sanctions on private foundations and their managers, as well as on the donors, for improper self-dealing and prohibitive transactions. Prerequisite: Law 336. (Examination) (Fall—evening)

559 Taxation—Oil and Gas (2)

Hambrick

Application of federal income tax law to producing segment of oil and gas industry. Classification of interests; treatment of exploration and development expenditures. Depletion allowance and concept of "economic interests." Sales and "ABC" transactions. Organization problems. Prerequisite: Law 336. (Examination)

560 Taxation—State and Local (2)

Schwartz

Taxation by state and local governments; problems of real and personal property taxation, sales and use taxes, business and personal income taxes. Limitations on taxation of interstate commerce. Congressional problems. Prerequisite: Law 336. (Problem Assignments and Choice of Paper or Examination) (Spring—evening)

562 Income Taxation of Foreign Business and Investment (2)

Hambrick

The provisions and policies of the federal income tax law applicable to foreign income, including considerations affecting the choice of methods of engaging in foreign business and investment, treatment of controlled foreign corporations, allocation of income in foreign commerce, credit for foreign taxes, principles and trends of U.S. tax treaties. (Examination)

564 Seminar: Special Problems of Tax Policy (2)

Ellicott, Schwartz

Intensive study of selected aspects of the tax structure with primary attention given to the federal income tax. Problem areas are reviewed primarily from the standpoint of tax policy, including legal, economic, social, and practical considerations. Alternative solutions, including current legislative proposals, are examined. Prerequisite: Law 336, 340. (Research Paper) (Fall—evening; summer 1970)

567 Seminar: Tax Practice and Procedure (2)

Kapp, Troyer

Review of the major areas of tax practice, including organization of the Internal Revenue Service, legislation, administrative regulations, tax planning, tax rulings, tax audit, settlement procedures, claims for refund, tax collection processes, criminal tax practice, and ethical problems in tax practice. Preparation of various documents is required. Prerequisite: Law 336. (Problem Assignments) (Fall and spring—evening)

568 Seminar: Federal Tax Litigation (2)

Treusch

Choice of forum. Conduct of civil tax cases: trial practice in the Tax Court, the District Courts, and the Court of Claims; appeal practice in the Courts of Appeals and on certiorari to the Supreme Court; analysis and drafting of pleadings, motions, and briefs; oral argument; settlements and stipulations of fact. Comparative responsibilities and procedures of IRS and of Justice for litigation control. Prerequisite: Law 567. (Writing Assignments) (Spring—evening)

Master of Laws candidates in the area of Taxation who have not taken the following courses or their equivalent as part of a Juris Doctor or Bachelor of Laws program should include them in their Master's program.

336 Taxation—Federal Income

or

340 Taxation—Federal Income, Corporations and Shareholders**338 Taxation—Federal Estate and Gift****351 Law and Accounting****OTHER RELATED COURSES****403 Public Economic Policy and the Law****404 Securities Regulation****424 Business Planning****427 Legal Aspects of International Business Transactions****URBAN LEGAL STUDIES**

Faculty Advisers: Jean Cahn, C.B. Nutting, Max Pock

571 Land Use Planning (2)

Nutting

Selected problems in urban redevelopment and housing, with particular emphasis on programs under current federal and state legislation. (Research Paper) (Spring—day)

573 Clinical Study in Urban Law (2 or 3 or 4)

Cahn

Clinical study of current problems in urban law. Enrollment limited to 12 students who will participate in group discussion and analysis of problems encountered in the field work of the Urban Law Institute. Prerequisite: Law 451. Admission by permission of the Urban Law Institute. Students may repeat this course for a maximum of 8 semester hours of credit. (Fall and spring—day)

575 Economic Development Planning for the Inner City (2)

Carlson

A substantive study, using a problem format, of alternative forms of organization for community economic development, including unincorporated associations, partnerships, nonprofit corporations, cooperative corporations, and profit corporations. Analysis of the corporate, financial, tax, and securities aspects of organizing a nonprofit action group, organizing and operating a neighborhood business, and developing additional housing. Prerequisite: Law 312. (Problem Assignments) (Fall—day)

Descriptions for the other courses in this area (listed below) appear elsewhere in "Advanced Courses."

451 Federal Programs for Urban Poverty (2)

453 Community Organizations (2)

458 Housing the Poor (2)

459 Problems of the Consumer (2)

461 Social Welfare Legislation and Administration (2)

501 Land Development Law (3)

505 Intergovernmental Relations I (2)

506 Intergovernmental Relations II (2)

560 Taxation—State and Local (2)

Master of Laws candidates in the area of Urban Legal Studies who have not taken the following course or its equivalent as part of a Juris Doctor or Bachelor of Laws program should include it in their Master's program.

349 Local Government Law

OTHER RELATED COURSES

407 Seminar: Regulation of Transportation I

408 Seminar: Regulation of Transportation II

445 Public Employee Labor Relations

460 Current Problems in Civil Rights

462 Family Law of the Poor

475 Law and Criminology I: Search for the Causes of Criminal Behavior

476 Law and Criminology II: Society's Responses to the Criminal Offender

477 The Police and the Community

487 Interdisciplinary Seminar on the Juvenile Court

504 Formulation of Natural Resources Policy

592 Seminar: Constitutional Law

OTHER ADVANCED COURSES

590 Population Control and the Law (2)

Miller

Consideration of the concept of an "optimum" population through an examination of existing statutes which encourage or discourage population growth; relevant Supreme Court cases; international policies of a public law nature leading to population stabilization; and proposed legislation. (Research Paper) (Fall—day)

591 Legislative Drafting (2)

Zweben

Advanced instruction and practice in legislative drafting. (Problem Assignments) (Spring—evening)

592 Seminar: Constitutional Law (2)

Dixon

Group study of contemporary problems in constitutional law; process of constitutional litigation; problems of effectuating constitutional guarantees. (Research Paper) (Spring—day)

593 Seminar: American Legal History (2)

D. Green

From the outbreak of the Revolution at Lexington and Concord to the death of John Marshall. An examination of men, events, and movements

significant in the unfolding of our laws and legal institutions in this formative period of our national life, including a critical examination of the place of the lawyer in a revolutionary age. Comparison of the role of the lawyer during the politically and socially unsettled time of Marshall with the role of the lawyer in today's troubled scene. Each member of the seminar presents the results of his research and thought either by an oral or by a written report. The grade of *CR* (credit) or *NC* (no credit) is given for this course. (Research Paper) (Spring—day)

595 Seminar: Supreme Court Practice (2)

Gressman

Study of the jurisdiction, practice, and procedure of the Supreme Court of the United States. Certiorari and appeal; the Court's Rules of Practice; how to prepare petitions and jurisdictional statements; the internal operation of the Supreme Court; other related aspects of Supreme Court practice, such as bail and stay applications, use of extraordinary writs, motions practice, oral argument, and briefing; *in forma pauperis* procedures. Students will prepare documents used in Supreme Court practice—petitions for certiorari, jurisdictional statements, and opposing briefs and arguments—using the actual conference list of cases pending before the Court. (Research Paper) (Spring—day)

596 Seminar: Contracts (2)

Freedman

Advanced problems in contracts, such as the relationship of contract and tort (substantively, procedurally, and in measuring damages), Article II of the Uniform Commercial Code, product liability, commercial frustration, unconscionability, remedies, and anticipatory breach, consumer's rights, and professional responsibility of the civil practitioner. Hours arranged at the convenience of the students. Admission by permission of instructor. (Research Paper)

598 Research in Public Law (2)

Staff

Registration limited to students with at least a *B* average who have had a seminar or comparable course in field of proposed research. Request in writing, with proposed outline of topic of research, must be submitted to the Dean at least one month prior to registration day. Work must be completed within the semester and paper submitted not later than last day of classes. Students may repeat this course once for credit with the approval of the Dean. (Research Paper) (Fall and spring)

599–600 Thesis (2–2)

Students must register for two successive semesters.

(Academic year)



SPECIAL PROGRAMS IN RESEARCH AND INSTRUCTION

GOVERNMENT CONTRACTS PROGRAM

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A COMPREHENSIVE GOVERNMENT CONTRACTS PROGRAM provides continuing instruction for industry and government personnel in this field and a program of courses leading to the Master of Laws degree in Government Procurement Law. The program includes (1) short seminars; (2) two-week courses in advanced problems in the field; (3) an annual institute treating a problem of contemporary importance; (4) an annual conference in a major area; (5) compilation of materials for use in current courses; (6) publication of a series of monographs treating special problems in the field; and (7) special research projects.

COMPUTERS-IN-LAW INSTITUTE

Director Irving Kayton

The Computers-in-Law Institute is coping with the problems posed by the advent of computers in the practice and theory of law. Projects are underway for the purpose of advancing the state of knowledge and pedagogical techniques connected with the law-computer interface. Major areas of current activity and interest include legal protection of computer programs (programs are the instructions by means of which the user instructs the machine to perform his tasks); antitrust problems in the computer industry; computerized legal information retrieval systems; automatic composition of legal publications; systems studies oriented toward preserving the privacy of the individual in connection with large computerized data centers; computerization of land records and mechanization of routine court administration; and the application of computer techniques to a generalized reapportionment procedure. Other areas of interest include the impact of the computer on taxes and telecommunications. Current educational programs include the annual "Law of Software Conference" and the "Computers and Tax Conference."

INSTITUTE OF LAW, PSYCHIATRY, AND CRIMINOLOGY

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The Institute of Law, Psychiatry, and Criminology draws upon the insights and techniques of the behavioral sciences in areas of mutual concern to law and its sister disciplines, with special emphasis in the fields of forensic psychiatry and criminology.

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The Law, Science, and Technology Program deals with the reciprocal relationships between law and science, providing courses, seminars, research studies, and publications to equip the legal profession to deal more effectively with the social, economic, political, and legal consequences of the nation's present massive commitment to scientific progress.

PATENT, TRADEMARK, AND COPYRIGHT RESEARCH INSTITUTE

Director Louis J. Harris

The Patent, Trademark, and Copyright Research Institute is engaged in gathering and disseminating knowledge regarding the principles, facts, and practical operations of the patent, trademark, copyright, and related systems of laws of the United States and other countries. The Institute journal, *IDEA*, is published five times yearly.

URBAN LAW INSTITUTE

Director Jean C. Cahn

The Urban Law Institute utilizes a coordinated approach between the legal profession and other professions, such as urban and regional planning, medicine, and epidemiology and environmental health, to develop solutions to the problems of the poor. The major goal is economic development of the inner-city by its inhabitants. Graduate lawyers, acting as corporate attorneys, assist the poor in creating viable legal institutions capable of developing management services and technical expertise needed to support community growth and change.

THE GEORGE WASHINGTON LAW ASSOCIATION

THE GEORGE WASHINGTON LAW ASSOCIATION was founded in 1912 and has been affiliated with the General Alumni Association since 1926. Its purposes as stated in the constitution are to promote high standards of legal education, to keep the alumni of the school in close touch with one another, especially with members of their own classes, to gather and publish at intervals information as to the whereabouts and activities of these alumni, and to further the interests of the school.

Eligible members are those who have matriculated in the school or National University and have left in good standing, and any member or former member of the faculty of the school. Active members are those eligible members who are current contributors to the Law Annual Support Program of the University and life members of the George Washington Law Association.

The Association plans publication periodically of the Law Alumni Directory. Law Alumni are urged to keep the Alumni Office informed of their whereabouts so that directory information can be kept up to date.

The Law Alumni Office is in Bacon Hall, 2000 H Street, N.W., Washington, D.C.

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THE UNIVERSITY

HISTORY AND ORGANIZATION

THE GEORGE WASHINGTON UNIVERSITY had its beginning in 1821 as The Columbian College in the District of Columbia. The name of the institution was changed in 1873 to Columbian University and in 1904 to The George Washington University. The debt of the University to George Washington, whose name it bears, is an intangible one.

George Washington, as President and as private citizen, had urgently insisted upon the establishment of a National University in the Federal City. There he hoped that, while being instructed in the arts and sciences, students from all parts of the country would acquire the habits of good citizenship, throwing off local prejudices and gaining at first hand a knowledge of the practice, as well as the theory, of republican government. To further the materialization of his hopes, Washington left a bequest of fifty shares of The Potomac Company "towards the endowment of a University to be established within the limits of the District of Columbia, under the auspices of the General Government, if that government should incline to extend a fostering hand towards it." The Congress never extended "a fostering hand." The Potomac Company passed out of existence, and Washington's bequest became worthless.

Fully conscious of Washington's hopes, but motivated primarily by a great missionary urge and the need for a learned clergy, a group of dedicated ministers and laymen sponsored a movement for the establishment of a college in the District of Columbia. Inspired largely by the zeal and energy of the Reverend Luther Rice, they raised funds for the purchase of a site and petitioned Congress for a charter. After much delay and amendment, Congress granted a charter which was approved by President Monroe on February 9, 1821. To safeguard the College's nonsectarian character it provided "that persons of every religious denomination shall be capable of being elected Trustees; nor shall any person, either as President, Professor, Tutor or pupil, be refused admittance into said College, or denied any of the privileges, immunities, or advantages thereof, for or on account of his sentiments in matters of religion."

During the entire time when the institution was known as Columbian College, its activities were centered on College Hill, a tract of forty-six and a half acres between the present Fourteenth and Fifteenth Streets extending north from Florida Avenue to somewhat beyond Columbia Road. The Medical School was located downtown. For the better part of the Columbian University period, the buildings of the University were situated along H Street between Thirteenth and Fifteenth Streets. The Medical School group still remains there.

During the last half century the University's present plant has been developed in that section of the old First Ward familiarly known as "Foggy Bottom," between Nineteenth and Twenty-fourth Streets, south of Pennsylvania Avenue. The area is not without its reminders of historic interest to the University. President Monroe, who signed the Charter, lived at 2017 Eye Street. The first President of the Board of Trustees, the Reverend Obadiah B. Brown, was for fifty years the pastor of a church at Nineteenth and Eye Streets, and Washington selected Twenty-third and E Streets as the site of the National University he had hoped to see established.

The University as it is now organized consists of Columbian College of Arts and Sciences (undergraduate); the Graduate School of Arts and Sciences; the professional schools, which include the National Law Center and the schools of Medicine, Engineering and Applied Science, Education, Government and Business Administration, Public and International Affairs; the College of General Studies; the Division of University Students; and the Summer Sessions.

The George Washington University is privately endowed and is governed by a self-perpetuating Board of Trustees of which the president is an ex officio member.

ACADEMIC STATUS

The George Washington University is accredited by its regional accrediting agency, the Middle States Association of Colleges and Secondary Schools. The University is on the approved list of the American Association of University Women and is a member of the College Entrance Examination Board.

LOCATION

The University is in downtown Washington, between Pennsylvania Avenue and 19th, F, and 24th Streets, N.W. In immediately adjacent areas are the White House, the World Bank, the United States Information Agency, the Department of the Interior, the Department of State, the General Services Administration, the National Academy of Sciences, and the Kennedy Center for the Performing Arts.

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- John Cibinic, Jr., *Professor of Law; Director of the Government Contracts Program*
B.A. 1956, University of Pittsburgh; J.D. 1960, George Washington University
- Reuben Clark, Jr., *Professorial Lecturer in Law*
B.A. 1943, LL.B. 1948, Yale University
- Manuel Frederick Cohen, *Professorial Lecturer in Law*
B.S. 1933, Brooklyn College; LL.B. 1936, LL.D. 1962, Brooklyn Law School
- Sheldon Stanley Cohen, *Professorial Lecturer in Law*
B.A. in Govt. 1950, J.D. 1952, George Washington University; C.P.A. 1952, State of Maryland
- Marcus Cohn, *Professorial Lecturer in Law*
B.A. 1935, J.D. 1938, University of Chicago; LL.M. 1940, Harvard University
- Thomas Francis Courtless, Jr., *Associate Professor of Law and Sociology*
B.A. 1955, Pennsylvania State University; M.A. 1960, Ph.D. 1966, University of Maryland
- John Henry Davidson, Jr., *Lecturer in Law*
B.A. 1964, Wake Forest University; J.D. 1967, University of Pittsburgh
- Georges Rene Delaume, *Professorial Lecturer in Law*
Diplôme de Docteur en Droit 1947, University of Paris, France; M.Comp.L. 1953, George Washington University
- Paul Gerald Dembling, *Professorial Lecturer in Law*
B.A. 1940, M.A. 1942, Rutgers, the State University; J.D. 1951, George Washington University
- Robert Galloway Dixon, Jr., *Professor of Law*
B.A. 1943, Ph.D. 1947, Syracuse University; LL.B. 1956, George Washington University
- James Francis Doherty, *Professorial Lecturer in Law*
B.A. 1953, Catholic University of America; LL.B. 1957, Georgetown University
- Donald Robert Dunner, *Associate Professorial Lecturer in Law*
B.S. in Ch.E. 1953, Purdue University; J.D. 1958, Georgetown University
- Paul East, *Assistant Professorial Lecturer in Law*
Barrister-at-Law 1966, Gray's Inn, England; M.B., B.S. 1968, University of London, England; LL.M. 1970, George Washington University

- Justin Lincoln Edgerton, *Professorial Lecturer in Law*
B.A. 1929, J.D. 1931, George Washington University
- Peter David Ehrenhaft, *Professorial Lecturer in Law*
B.A. 1954, LL.B., M.I.A. 1957, Columbia University
- John LeMoyne Ellicott, *Professorial Lecturer in Law*
B.A. 1951, Princeton University; LL.B. 1954, Harvard University
- Robert Harold Elliott, Jr., *Professorial Lecturer in Law*
B.S. 1955, University of Kansas; J.D. 1958, University of Michigan
- Pasquale Joseph Federico, *Professorial Lecturer in Law*
B.S. 1923, Case Western Reserve University; M.A. 1925, George Washington University; LL.B. 1932, American University
- Ralph Carmine Ferrara, *Lecturer in Law*
B.S. in B.A. 1967, Georgetown University; J.D. 1970, University of Cincinnati
- Elyce Zenoff Ferster, *Professor of Law*
B.S. 1951, University of Wisconsin; LL.B. 1954, Northwestern University
- * Monroe Henry Freedman, *Professor of Law*
B.A. 1952, LL.B. 1954, LL.M. 1956, Harvard University
- Gilbert Jerome Ginsburg, *Associate Professor of Law; Assistant Director of the Government Contracts Program*
B.A. 1954, B.A. in Law 1955, J.D. 1957, University of Chicago
- Ronald Goldfarb, *Professorial Lecturer in Law*
B.S. 1954, LL.B. 1956, Syracuse University; LL.M. 1960, J.S.D. 1963, Yale University
- William Wolcott Goodrich, *Professorial Lecturer in Law*
LL.B. 1938, University of Texas at Austin
- † David Crittenden Green, *Professor of Law*
B.A. 1948, Harvard University; LL.B. 1951, University of Virginia
- Harold Paul Green, *Professor of Law; Director of the Law, Science, and Technology Program*
B.A. 1942, J.D. 1948, University of Chicago
- Eugene Gressman, *Associate Professorial Lecturer in Law*
B.A. 1938, J.D. 1940, University of Michigan
- Joseph Harris Guttentag, *Professorial Lecturer in Law*
B.A. 1950, University of Michigan; LL.B. 1953, Harvard University
- ‡ Jackson Reid Hambrick, *Professor of Law*
B.A. 1938, Wofford College; LL.B. 1942, Duke University
- Louis James Harris, *Professor of Law; Director of the Patent, Trademark, and Copyright Research Institute*
B.A. 1932, Cornell University; LL.B. 1939, S.J.D. 1942, Brooklyn Law School; LL.M. 1948, George Washington University
- Murdock Head, *Professor of Medical and Public Affairs*
D.D.S. 1947, University of Louisville; M.D. 1953, University of Vermont; J.D. 1958, George Washington University
- Philip Field Herrick, *Professorial Lecturer in Law*
B.A. 1929, Williams College; LL.B. 1933, LL.M. 1936, George Washington University
- James Daniel Hill, *Professorial Lecturer in Law*
B.A. 1936, J.D. 1938, University of Iowa
- Thomas Willard Holland, *Professorial Lecturer in Law*
B.A. 1923, University of Michigan; LL.B. 1934, Columbia University; Ph.D. 1939, University of Wisconsin
- Eugene Gary Horowitz, *Associate Professorial Lecturer in Law*
B.A. in Govt. 1958, J.D. 1961, George Washington University
- Tao-tai Hsia, *Professorial Lecturer in Law*
LL.B. 1945, National Cheng-chi University, China; LL.M. 1950, J.S.D. 1952, Yale University
- John Wingfield Jackson, *Adjunct Professor of Law*
B.S. 1928, University of Pennsylvania; J.D. 1932, George Washington University
- Hugh Jascourt, *Associate Professorial Lecturer in Law*
B.A. 1956, University of Pennsylvania; J.D. 1960, Wayne State University

* On leave of absence 1970-71.

† On sabbatical leave fall semester 1970-71.

‡ On sabbatical leave spring semester 1971.

- Alan Hirsh Kaplan, *Professorial Lecturer in Law*
B.A. 1951, LL.M. 1957, New York University; LL.B. 1954, Harvard University
- Robert Harris Kapp, *Associate Professorial Lecturer in Law*
B.S. 1955, University of Pennsylvania; J.D. 1958, University of Michigan
- *Irving Kayton, *Professor of Law; Co-director of the Computers-in-Law Institute; Director of the Patent Law Program*
B.A. 1951, Cornell University; LL.B. 1957, New York University; LL.M. 1964, J.S.D. 1967, Columbia University
- John Alexander Kendrick, *Professorial Lecturer in Law*
B.A. 1942, LL.B. 1943, George Washington University
- Gladys Kessler, *Associate Professorial Lecturer in Law*
B.A. 1959, Cornell University; LL.B. 1962, Harvard University
- William Wallace Kirkpatrick, *Professor of Law; Associate Dean of the National Law Center*
B.A. 1934, LL.B. 1938, Harvard University
- Robert Alan Klayman, *Associate Professorial Lecturer in Law*
B.S. 1951, LL.B. 1954, West Virginia University
- Vincent Kleinfeld, *Professorial Lecturer in Law*
LL.B. 1929, Columbia University
- Robert Kramer, *Professor of Law; Dean of the National Law Center*
B.A. 1935, LL.B. 1938, Harvard University
- Jack Kratchman, *Associate Professorial Lecturer in Law*
B.S. 1948, City College, New York; M.S. 1952, New York University; J.D. 1964, George Washington University
- Roger Stroock Kuhn, *Professor of Law*
B.A. 1948, Harvard University; LL.B. 1951, Columbia University
- Herbert Joseph Liebesny, *Professorial Lecturer in Law*
J.D. 1935, University of Vienna, Austria
- William Thomas Mallison, Jr., *Professor of Law*
J.S.D. 1967, Yale University
- Arthur Francis Mathews, *Associate Professorial Lecturer in Law*
B.A. 1959, Union College, New York; J.D. 1962, Union University, New York; LL.M. 1964, Georgetown University
- Louis Harkey Mayo, *Professor of Law; Vice President for Advanced Policy Studies*
B.S. 1940, U.S. Naval Academy; LL.B. 1949, University of Virginia; J.S.D. 1953, Yale University
- John Albert McIntire, *Professorial Lecturer in Law*
B.A. 1929, LL.D. 1954, Wittenberg University; LL.B. 1931, University of Cincinnati
- †Leroy Sorenson Merrifield, *Professor of Law*
B.A. 1938, LL.B. 1941, University of Minnesota; M.P.A. 1942, S.J.D. 1956, Harvard University
- Arthur Selwyn Miller, *Professor of Law*
B.A. 1938, Willamette University; LL.B. 1949, Stanford University; J.S.D. 1959, Yale University
- Milton Mitchell, *Assistant Professorial Lecturer at Law*
J.D. 1942, George Washington University
- Jerome Christian Muys, *Visiting Professor of Law*
B.A. 1954, Princeton University; LL.B. 1957, Stanford University
- Ralph Nader, *Professorial Lecturer in Law*
B.A. 1955, Princeton University; LL.B. 1958, Harvard University
- Ralph Clarke Nash, Jr., *Professor of Law; Associate Dean of the National Law Center, for Graduate Studies, Research, and Projects*
B.A. 1953, Princeton University; J.D. 1957, George Washington University
- Lester Nurick, *Professorial Lecturer in Law*
B.S.S. 1934, City University of New York; LL.B. 1937, Brooklyn Law School
- Charles Bernard Nutting, *Professor of Law*
B.A. 1927, J.D. 1930, University of Iowa; LL.M. 1932, S.J.D. 1933, Harvard University; LL.D. 1957, University of Pittsburgh; Litt.D. 1957, Geneva College; L.H.D. 1957, Seton Hill College; LL.D. 1960, Dickinson College of Law

* On sabbatical leave fall semester 1970-71.

† On sabbatical leave spring semester 1971.

- Robert Eugene Park, *Professor of Law*
B.S. 1952, B.A. 1957, J.D. 1961, University of Florida; LL.M. 1965, Yale University
- Carol Per Lee Plumb, *Lecturer in Law*
B.A. 1955, Wagner College; J.D. 1970, Howard University
- Max Pock, *Professor of Law*
J.D. 1958, University of Iowa; S.J.D. 1962, University of Michigan
- Edward Andrew Potts, *Professor of Law; Associate Dean of the National Law Center*
B.A. 1949, University of Michigan; LL.B. 1952, George Washington University
- Bernard Ramundo, *Professorial Lecturer in Law*
B.A. 1947, City University of New York; LL.B. 1949, M.A. 1957, Columbia University; Ph.D. 1966, American University
- Arnold Winfred Reitze, *Professor of Law*
B.A. 1960, Fairleigh Dickinson University; J.D. 1962, Rutgers, the State University
- David Robinson, Jr., *Professor of Law*
B.A. 1950, Reed College; J.D. 1956, Columbia University; LL.M. 1965, Harvard University
- Susan Deller Ross, *Assistant Professorial Lecturer in Law*
B.A. 1964, Knox College; J.D. 1970, New York University
- Eugene Harvey Rotberg, *Professorial Lecturer in Law*
B.S. 1951, Temple University; LL.B. 1954, University of Pennsylvania
- Donald Phillip Rothschild, *Professor of Law*
B.A. 1950, University of Michigan; J.D. 1965, University of Toledo; LL.M. 1966, Harvard University
- Joseph Michael Francis Ryan, Jr., *Professorial Lecturer in Law*
B.A. 1943, St. Joseph's College; LL.B. 1950, LL.M. 1952, Georgetown University; Judge, District of Columbia Court of General Sessions
- Lewis Aaron Schiller, *Professor of Law*
B.A. 1950, LL.B. 1952, University of Texas at Austin; M.A. 1958, Tufts University
- Charles Wilson Schoeneman, *Associate Professorial Lecturer in Law*
B.A. 1953, Bowdoin College; LL.B. 1958, Harvard University
- Arthur Leonard Schwartz, *Professorial Lecturer in Law*
B.A. 1963, City College, New York; LL.B. 1966, LL.M. 1967, New York University
- David Earl Seidelson, *Professor of Law*
B.A. 1951, LL.B. 1956, University of Pittsburgh
- David James Sharpe, *Professor of Law*
B.A. 1950, University of North Carolina at Chapel Hill; LL.B. 1955, S.J.D. 1969, Harvard University
- George Walter Shelhorse, *Professorial Lecturer in Law*
J.D. 1951, George Washington University
- Dudley Graham Skinker, *Clerk of the Trial Practice Court*
LL.B. 1940, George Washington University
- William Marvin Speiller, *Professorial Lecturer in Law*
B.S. 1950, LL.B. 1952, Syracuse University; LL.M. 1953, Harvard University
- John Regan Stark, *Professorial Lecturer in Law*
B.A. 1938, Cornell University; M.P.A. 1947, New York University; J.D. 1952, George Washington University
- James Edward Starrs, *Professor of Law*
B.A., LL.B. 1958, St. John's University, New York; LL.M. 1959, New York University
- Alexander Louis Stevas, *Professorial Lecturer in Law*
B.A. 1949, LL.B. 1951, George Washington University
- Robert Paul Stranahan, *Professorial Lecturer in Law*
B.A. 1951, Princeton University; LL.B. 1954, Harvard University
- Theodore Tannenwald, Jr., *Professorial Lecturer in Law*
B.A. 1936, Brown University; LL.B. 1939, Harvard University
- Robert Max Tobias, *Associate Professorial Lecturer in Law*
B.A. 1965, M.B.A. 1967, University of Michigan; J.D. 1969, George Washington University
- Paul Ellsworth Treusch, *Professorial Lecturer in Law*
Ph.B. 1932, J.D. 1935, University of Chicago
- Thomas Alfred Troyer, *Associate Professorial Lecturer in Law*
B.A. 1955, Harvard University; J.D. 1958, University of Michigan

Stefan Franklin Tucker, *Associate Professorial Lecturer in Law*

B.A. 1960, J.D. 1963, University of Michigan

David Benson Weaver, *Professor of Law*

B.A. 1943, Ohio Wesleyan University; J.D. 1948, Case Western Reserve University

Glen Earl Weston, *Professor of Law*

B.S. 1943, University of Maryland; J.D. 1948, George Washington University

Murray Zweben, *Associate Professorial Lecturer in Law*

B.S. 1952, State University of New York at Albany; LL.B. 1959, George Washington University



THE NATIONAL LAW CENTER RECORD 1969-70

Degrees Conferred

ANNUAL COMMENCEMENT, JUNE 8, 1969

JURIS DOCTOR

Student Marshal: Douglas George Robinson

Martin Abramson, New York
(With Honors)
B.E. 1965, City College, New York
Frederick Lynn Alexander, Virginia
B.A. 1961, Cornell University
Gary Ross Allen, District of Columbia
(With Honors)
B.A. 1963, Northwestern University
David Elsworth Anderson, Virginia
(With Honors)
B.S. in A.E. 1954, West Virginia University
M.S. in Ac. 1958, A.E. 1960, California
Institute of Technology
Robert Arthur Bartlett, New York
(With Honors)
B.A. 1966, Yale University
Leon Irwin Baumgarten, Pennsylvania
B.A. 1966, Pennsylvania State University
Joseph Norman Beecroft, Virginia
B.A. 1965, Brigham Young University
Bruce Charles Bereano, New York
B.A. 1966, George Washington University
John Wolf Berkey, Jr., North Dakota
B.A. 1966, North Dakota State University
Robert Alfredo Bernstein, Maryland
B.A. 1966, Pennsylvania State University
Madeleine Sophie Bial, District of Columbia
B.A. 1964, Miami University
John James Blanchard, Illinois
(With Honors)
B.S. 1966, Seton Hall University
John William Blouch, Indiana
(With Honors)
B.A. 1962, Yale University
Ronnie Blumenthal, New Jersey
B.A. 1966, George Washington University
Alvin Paul Blyer, New York
(With Honors)
B.A. 1966, Brooklyn College

Henry William Bogsch, District of Columbia
B.S. in F.S. 1966, Georgetown University
Burt Alan Braverman, New York
(With Honors)
B.A. 1966, Miami University
Joseph Frederick Breimayer, District of
Columbia
B.E.E. 1965, University of Detroit
Lloyd Eugene Brelsford, Virginia
(With Honors)
B.A. 1963, Washington State University
Thomas Stephen Brigham, District of Columbia
(With Honors)
B.A. 1966, Fresno State College
Warner Francis Brundage, Jr., Maryland
(With Honors)
B.A. 1966, University of Southern California
Arthur Bates Butler III, Arizona
B.A. 1966, Trinity University
Joseph Edward Caldwell, New Mexico
B.A. 1966, Colorado College
Geoffrey David Cant, Maryland
(With Honors)
B.S. 1959, U.S. Naval Academy
Don Stirling Carpenter, Pennsylvania
B.A. 1966, Pennsylvania State University
Carl Wesley Carson, District of Columbia
(With Honors)
B.A. 1961, Drew University
M.A. 1962, Tufts University
Edith Jane Carson, North Carolina
B.A. 1966, Duke University
Lawrence Jay Chandler, New York
B.A. 1966, Boston University
Joseph Philip Charney, New York
B.A. 1966, Brooklyn College
Paul William Chemnick, Arizona
(With Honors)
B.A. 1966, George Washington University

- John Michael Cleary, Virginia
(With Honors)
B.A. 1965, Catholic University of America
- John Peter Clum, Maryland
(With Honors)
B.A. 1966, George Washington University
- Charles Windham Collett, District of Columbia
B.A. 1966, George Washington University
- Gary Randolph Comstock, Virginia
(With Honors)
B.S. 1964, Brigham Young University
- Elaine Roemisch Crane, Ohio
(With Honors)
B.A. 1966, Vassar College
- Arthur Ray Crawford, Virginia
B.S. 1966, Ohio Northern University
- John Knowles Crummey, Maryland
B.A. 1962, American University
- Andrew Cook Culbert, Massachusetts
B.A. 1966, University of New Hampshire
- Gary Miles Cunningham, Tennessee
B.A. 1966, University of Michigan
- Michael Joseph Daly, Virginia
B.A. 1966, Bucknell University
- Catherine Jane Damme, Nebraska
B.A. 1966, Mount Holyoke College
- Michael Rhodes Davis, New York
B.S. 1965, Rochester Institute of Technology
- Joseph Henry Dettmar, Virginia
B.A. 1966, LaSalle College
- Joel Paul Dictrow, New York
(With Honors)
B.A. 1966, New York University
- Michael William Dolan, Virginia
(With Honors)
B.A. 1964, University of Kansas
- William John Dowell, Virginia
(With Honors)
B.A. 1966, George Washington University
- James Thomas Duff, Maryland
B.B.A. 1966, George Washington University
- Craig Burgett Dunbar, Virginia
B.A. 1966, Texas A&M University
- John Stephan Ebel, Virginia
(With Honors)
B.S. 1966, Washington University
- Robert Eugene Eisenbud, New York
B.A. 1965, Washington College
- Saul Elbaum, Maryland
B.E.E. 1965, City College, New York
- John Walter English, Virginia
(With Honors)
B.A. 1966, University of Michigan
- Leslie Gene Fleet, Virginia
(With Honors)
B.A. 1965, American University
- Charles Henry Fleischer, District of Columbia
(With Honors)
B.A. 1966, University of Rochester
- Joel Francis Gardiner, Virginia
(With Honors)
B.A. 1966, University of Massachusetts
- Robert Steven Gelman, New York
B.A. 1966, Brooklyn College
- Stephen Thomas Gillingham, Pennsylvania
B.A. 1966, Juniata College
- Robert Efrom Glasgow, Oregon
(With Honors)
B.A. 1966, George Washington University
- Daniel Robert Glickman, Kansas
(With Honors)
B.A. 1966, University of Michigan
- Steven Lee Godwin, Nevada
B.S. 1966, Brigham Young University
- Charles Paul Gogolak, District of Columbia
(With Honors)
B.A. 1966, Princeton University
- Richard I. Goldsand, Virginia
(With Honors)
B.A. 1966, George Washington University
- Philip Robert Goldsmith, Virginia
(With Honors)
B.S. 1966, Pennsylvania State University
- Bruce Goldstein, Virginia
(With Honors)
B.A. 1966, University of North Carolina at Chapel Hill
- Kenneth Webster Goshorn, Pennsylvania
(With Honors)
B.A. 1966, Carleton College
- James Evan Goulding, Virginia
B.S. 1965, Brigham Young University
- Lawrence Gilbert Graev, New York
(With Honors)
B.S. 1966, Cornell University
- Roger Everett Greenberg, Virginia
B.A. 1966, University of Maryland
- Jeffrey Wayne Grove, Maryland
(With Honors)
B.A. 1965, Juniata College
- Clark Sanders Gruening, Alaska
B.A. 1965, University of Oregon
- Patricia Dorothy Gurne, District of Columbia
B.A. 1965, MacMurray College
- David Hillel Guthman, California
B.A. 1963, California State College at Long Beach
- M.P.A. 1965, University of Southern California
- Thomas West Hammond III, Virginia
(With Honors)
B.B.A. 1966, George Washington University
- Stephen Mark Harmsen, District of Columbia
B.S. 1966, University of Utah
- Bruce Burleson Hart, Maryland
(With Honors)
B.S. 1962, Western Michigan University
- Pierre Michael Hartman, Virginia
B.A. 1958, University of Colorado
- Michael David Hausfeld, Virginia
(With Honors)
B.A. 1966, Brooklyn College
- Michael Arnold Hertzberg, District of Columbia
B.A. 1966, Colgate University
- Charles Andrew Hollander, New York
B.A. 1966, University of Pittsburgh
- Michael Stephen Hollins, New York
B.A. 1966, Washington and Jefferson College
- Michael Joseph Holloran, District of Columbia
B.A. 1966, George Washington University
- Harold Huberfeld, Maryland
B.S. in E.E. 1965, Drexel Institute of Technology
- Raymond Morrow Hunter, Arizona
B.A. 1966, Stanford University
- William Earl Isaelf, Virginia
(With Honors)
B.S. 1966, University of Nevada
- Robert Lahr James, Maryland
B.A. 1966, Cornell University
- Robert Alexander Johnson, District of Columbia
B.A. 1957, M.A. 1961, Marshall University

Wayne Merrill Johnson, Maine
B.A. 1965, University of Maine
Robert Barry Joselow, New York
B.A. 1966, New York University
Robert Eugene Josten, Virginia
B.A. 1964, Morningside College
Stephany Louise Joy, New York
B.S. 1963, Le Moyne College
M.A. 1965, George Washington University
Tobey Walter Kaczynski, District of Columbia
(With Honors)
B.A. 1966, Harvard University
Bertrand Jay Kahn, New York
B.A. 1966, George Washington University
Paul Jay Kaller, Virginia
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B.A. 1966, Syracuse University
Raymond Allen Keeney, Connecticut
B.A. 1965, Yale University
Thomas Daniel Kiley, District of Columbia
(With Honors)
B.S. 1965, Pennsylvania State University
Donald Frank Klasik, Pennsylvania
(With Honors)
B.A. 1966, Youngstown University
Carol Cole Kleinman, Virginia
(With Honors)
B.A. 1966, Northwestern University
Louise Osborne Knight, Missouri
(With Honors)
B.A. 1966, Wellesley College
John Richard Knop, Virginia
(With Honors)
B.A. 1966, Indiana University
Charles Howard Koch, Jr., Maryland
(With Honors)
B.A. 1966, University of Maryland
Jason David Kogan, Connecticut
B.A. 1966, Pennsylvania State University
Charles Alfred Koons, Jr., Connecticut
B.A. 1965, Cornell University
Bruce Stephen Kramer, New Jersey
(With Honors)
B.A. 1966, Washington and Lee University
James Marshall Kramon, New York
(With Honors)
B.S. 1966, Carnegie-Mellon University
Marshall Edward Kresman, Pennsylvania
B.S. 1966, Drexel Institute of Technology
Barry Howard Krinsky, New York
(With Honors)
B.A. 1966, Brooklyn College
Prithvi Chand Lall, District of Columbia
B.S. 1950, Government College, Hoshiarpur, India
M.S. 1954, Panjab University, India
Ph.D. 1962, Oregon State University
Kenneth Alan Latimer, Maryland
(With Honors)
B.S. 1966, University of Wisconsin
Theodore Moreau Leary, Jr., District of Columbia
(With Honors)
B.A. 1966, Harvard University
Wayne Lewis Lesser, New Jersey
B.A. 1966, Lafayette College
Roy Paul Lessy, Jr., Pennsylvania
B.A. 1966, Franklin and Marshall College
Richard Andrew Levie, New Jersey
B.A. 1966, Dickinson College

Theodore Alan Levine, New Jersey
(With Honors)
B.A. 1966, Rutgers, the State University
Marshall Harvey Lichtenstein, Georgia
(With Honors)
B.A. 1966, University of North Carolina at
Chapel Hill
Michael Herbert Lipson, Connecticut
(With Honors)
B.A. 1966, University of Connecticut
Robert John Logan, District of Columbia
B.S. 1966, University of Utah
Darrel Lee Longest, Maryland
B.A. 1965, Georgetown University
Ira Saul Loss, Connecticut
(With Honors)
B.A. 1966, University of Connecticut
Michael Ira Luber, Pennsylvania
B.A. 1966, Pennsylvania State University
Mark Ira Lurie, District of Columbia
B.A. 1966, Brown University
Joseph John Malandra, Jr., California
B.A. 1962, University of Maryland
David Elia Manooogian, Illinois
B.A. 1966, Dickinson College
Eric Bruce Marcy, Virginia
B.A. 1966, George Washington University
Robert Stephen Marks, New York
B.A. 1966, Brown University
Allan A. Martin, New York
(With Honors)
B.B.A. 1966, City College, New York
Roy I. Martin, New York
B.A. 1966, Adelphi University
William Jacko Massie, Jr., Connecticut
(With Honors)
B.S. 1968, Morehouse College
James Virgil Mattingly, Jr., District of Columbia
B.B.A. 1966, George Washington University
Timothy Bernard Matz, District of Columbia
(With Honors)
B.A. 1966, University of Virginia
William Bruce Mayfield, Virginia
B.A. 1966, Yale University
Robert Lawrence McCaffrey, Jr., Illinois
B.A. 1966, Colgate University
Lynne Church McCoy, District of Columbia
B.A. 1966, Goucher College
Jeffrey Stephen Mednick, Maryland
B.S. in M.E. 1965, Drexel Institute of
Technology
Michael Stein Meisel, Virginia
B.A. 1966, Miami University
Thomas Paul Miano, Connecticut
B.A. 1966, Providence College
Warren Lloyd Miller, Virginia
(With Honors)
B.A. 1966, American University
William Everett Morley, Delaware
(With Honors)
B.A. 1964, University of Maryland
M.B.A. 1966, George Washington University
Samuel Wheeler Morris, Jr., Pennsylvania
B.A. 1966, Harvard University
Kenneth Scott Muldoon, New York
B.A. 1966, Brown University
Paul Gunnar Nelson, New York
B.A. 1966, Colgate University
Richard Clark Nelson, District of Columbia
B.A. 1966, Clark University

- Terry Arnold Newendorp, Virginia
(With Honors)
B.S. in Ch.E. 1966, Purdue University
- Alan Lloyd Newman, Maryland
(With Honors)
B.S. in E.E. 1965, University of Maryland
- Robert Charles Ollman, New York
B.A. 1966, Colgate University
- T. Rodney Oppmann, Ohio
B.A. 1965, Princeton University
- William Church Osborn, Pennsylvania
B.A. 1966, Princeton University
- Thomas Churchill Palmer, District of Columbia
B.A. 1966, Howard University
- Thomas Gerald Parachini, Virginia
B.A. 1966, Michigan State University
- Louis Ira Parley, New York
(With Honors)
B.A. 1966, City College, New York
- Sherman Odell Parrett, Virginia
(With Honors)
B.S. in E.E. 1965, University of Cincinnati
- Robert Nathan Pass, Rhode Island
(With Honors)
B.A. 1966, Brown University
- Roger Allan Perkins, Maryland
(With Honors)
B.A. 1964, Pennsylvania State University
- Fred Anderson Phelps, Virginia
(With Honors)
B.S. 1961, Pennsylvania State University
- Kenneth Roland Pike, New Jersey
(With Honors)
B.A. 1966, Cornell University
- William Joel Poltarak, New York
B.A. 1966, Pennsylvania State University
- Thomas Andrew Pursley III, New York
B.A. 1966, Colgate University
- John Chester Pyles III, District of Columbia
(With Honors)
B.A. 1965, M.B.A. 1966, Dartmouth College
- Gary G. Quintiere, Virginia
(With Honors)
B.A. 1966, Lafayette College
- Richard Michael Resnik, Virginia
(With Honors)
B.A. 1966, Fairleigh Dickinson University
- Joseph Michael Revesz, Virginia
(With Honors)
B.S. in E.E. 1965, Newark College of Engineering
- Douglas George Robinson, Virginia
(With Highest Honors)
B.A. 1965, University of Washington
- Martin Howard Rogol, New York
B.A. 1966, University of Cincinnati
- Michael Barry Rosenberg, New York
(With Honors)
B.A. 1966, Brooklyn College
- Stephen Charles Royer, District of Columbia
B.A. 1966, George Washington University
- David Rutstein, Pennsylvania
(With Honors)
B.A. 1966, University of Pennsylvania
- David Sapadin, New York
(With Honors)
B.A. 1965, Brooklyn College
- John Philip Saunty, Jr., Washington
B.S. in F.S. 1965, Georgetown University
- William A. Schainker, District of Columbia
B.S. in B.A. 1966, Washington University
- Charles Kane Schanker, Virginia
(With Honors)
B.B.A. 1966, George Washington University
- Michael Paul Schaum, New York
B.A. 1966, University of Michigan
- Myles Richard Scheer, New Jersey
B.A. 1966, Rutgers, the State University
- Richard Benjamin Schiff, Virginia
(With Honors)
B.A. 1966, University of Michigan
- Jeffrey Hugh Schneider, New York
(With Honors)
B.A. 1966, New York University
- Lenore Bardón Schneiderman, Virginia
B.A. 1966, Hunter College
- David Elliot Schreiber, New Jersey
B.A. 1966, University of Virginia
- Richard Warren Schroeder, Virginia
B.S. 1966, Wisconsin State University, La Crosse
- Daniel Carl Schwartz, District of Columbia
(With Highest Honors)
B.A. 1965, Stanford University
- David Ira Schwartz, New York
B.Ch.E. 1966, Pratt Institute
- M. Gerald Schwartzbach, Pennsylvania
B.A. 1966, Washington and Jefferson College
- Lester Barry Seidel, Maryland
(With Honors)
B.A. 1966, University of Michigan
- Dorothy Davidson Sellers, District of Columbia
(With Honors)
B.A. 1965, Stanford University
- James Vincent Setta, Virginia
B.A. 1966, University of Maryland
- Elliott Charles Shapiro, New York
B.A. 1966, Syracuse University
- Edward Felix Shay, Pennsylvania
B.A. 1966, Colgate University
- Wallace Walter Sherwood, New York
B.A. 1966, St. Vincent College
- Frank Stanton Simons, Jr., District of Columbia
(With Honors)
B.A. 1966, University of Colorado
- Thomas Michael Singman, District of Columbia
(With Honors)
B.A. 1966, University of Michigan
- Alfred August Siss, Jr., New Jersey
B.A. 1966, Gettysburg College
- Richard Paul Slivka, Virginia
(With Honors)
B.S. 1966, Arizona State University
- Jerry Morgan Smedley, Maryland
B.A. 1964, Indiana University
- Marshall Avrum Snider, Illinois
(With Honors)
B.A. 1966, Washington University
- Richard Ian Solomon, Michigan
(With Honors)
B.A. 1966, University of Michigan
- Gerald Ira Sommer, New York
B.A. 1966, American University
- Gaylin Gramse Sponis, Massachusetts
(With Honors)
B.A. 1966, Mount Holyoke College
- Mento Anthony Sponis, Virginia
(With Honors)
B.A. 1966, Princeton University
- Virginia Ann Spiegel, District of Columbia
B.A. 1966, Mount Holyoke College

Thomas John Steich, Ohio
 B.A. 1966, George Washington University
 Barry Gene Stein, Connecticut
 B.A. 1966, Temple University
 Andrew Roy Stoller, New York
 B.S. 1966, Cornell University
 Peter Harry Stolz, New York
 (With Honors)
 B.A. 1966, University of Rochester
 Seth Stopek, Virginia
 (With Honors)
 B.A. 1966, Syracuse University
 Terrance E. Swanson, Maryland
 B.A. 1963, Coe College
 Dennis Elmo Talbot, Jr., Virginia
 B.S. 1961, Virginia Polytechnic Institute
 Henry Willard Tarring II, Virginia
 (With Honors)
 B.Ch.E. 1959, Rensselaer Polytechnic Institute
 Dennis Howard Taylor, Virginia
 (With Honors)
 B.A. 1966, Colgate University
 Martin Gibson Taylor III, Kentucky
 B.S. 1964, Eastern Kentucky University
 Bruce Jay Teck, District of Columbia
 B.S. 1957, University of North Carolina at
 Chapel Hill
 Lynn Evan Thomas, Idaho
 B.A. 1961, Idaho State University
 M.S. 1964, Boston University
 Ronald Irwin Tish, New York
 (With Honors)
 B.A. 1966, Brooklyn College
 Robert Max Tobias, Virginia
 (With Honors)
 B.A. 1965, University of Michigan
 Wilson John Trombley, Virginia
 B.A. 1966, Fairfield University
 Thomas Adkins Turner, Jr., Georgia
 B.E.E. 1964, Georgia Institute of Technology

MASTER OF LAWS

David Bender, Rhode Island
 B.S. 1961, Brown University
 LL.B. 1968, University of Pennsylvania
 Steven Leslie Briggerman, District of Columbia
 B.A. 1965, University of Chicago
 J.D. 1968, George Washington University
 Thomas Joseph Costa, Jr., New Jersey
 B.A. 1964, Roanoke College
 LL.B. 1967, Catholic University of America
 Joseph William Dellapenna, Virginia
 B.B.A. 1965, University of Michigan
 J.D. 1968, Detroit College of Law
 Marion Altus Fallwell, Virginia
 B.A. 1961, LL.B. 1964, Baylor University
 Gordon Barry Fields, Virginia
 LL.B. 1962, Reed College
 David Kesler Fromme, Kansas
 B.A. 1962, J.D. 1965, Washburn University of
 Topeka
 Richard Harold Gins, Maryland
 B.A. 1964, University of North Carolina at
 Chapel Hill
 J.D. 1967, George Washington University
 Frank Davis Hill, Texas
 B.B.A. 1963, University of Oklahoma
 LL.B. 1966, University of Texas at Austin

Kenneth Richard Umans, New York
 B.A. 1966, Pennsylvania State University
 James Donald Vitarello, New York
 B.A. 1966, University of Toledo
 Douglas Alan Warshof, Virginia
 (With Honors)
 B.A. 1966, Boston University
 George Daniel Webb II, Virginia
 (With Honors)
 B.A. 1965, Michigan State University
 Martin Howard Weisfuse, New York
 (With Honors)
 B.A. 1966, Brooklyn College
 Kenneth Robert West, Maryland
 B.B.A. 1966, George Washington University
 Stephen Hennington Whilden, California
 B.A. 1963, San Francisco State College
 Perry Albert White, Jr., Virginia
 B.A. 1966, Denison University
 Sherwood Skelton Willard, Connecticut
 B.A. 1966, University of Virginia
 John Franklin Wilson III, Virginia
 (With Honors)
 B.A. 1962, Colgate University
 John Harper Witmer, Jr., Maryland
 (With Honors)
 B.A. 1962, Pennsylvania State University
 Sue Anne Wolff, Ohio
 (With Honors)
 B.A. 1961, Trinity College, D.C.
 James Ralph Wright, Virginia
 (With Honors)
 B.S. 1966, Ohio State University
 Alexander B. Younger, District of Columbia
 (With Honors)
 B.A. 1965, University of Pennsylvania
 Ira Louis Zankel, New York
 B.A. 1966, Brooklyn College
 Louis Michael Zigman, Virginia
 (With Honors)
 B.S. 1966, New York University

Roger Keith Hoover, New Jersey
 B.A. 1961, LL.B. 1964, Rutgers, the State
 University
 Richard Michael Horwood, District of Columbia
 B.A. 1962, Colgate University
 LL.B. 1965, University of Pennsylvania
 Gerald William Hyland, Virginia
 B.S. 1959, College of the Holy Cross
 LL.B. 1962, Georgetown University
 Lawrence Levy, Virginia
 B.A. 1963, University of Pennsylvania
 LL.B. 1966, Boston University
 Walter Laughn Lewis, Virginia
 B.A. 1947, LL.B. 1950, University of Virginia
 Sharon Kay Lieblich, Virginia
 B.A. 1963, Barnard College
 LL.B. 1966, Harvard University
 Robert Duane Linder, Virginia
 B.A. 1954, J.D. 1959, University of Iowa
 M.B.A. 1961, Harvard University
 Stanley Glen Mazaroff, District of Columbia
 B.A. 1960, LL.B. 1965, University of Maryland
 Edward Garrison Neal, Maryland
 B.A. 1962, Florida State University
 LL.B. 1966, Eastern College

Roy Nerenberg, Maryland
 B.S. 1959, University of Pennsylvania
 LL.B. 1962, Temple University
 Carlton Thomas Normand, Texas
 B.A. 1963, University of Texas at Austin
 LL.B. 1964, Baylor University
 Thomas William Reilly, Virginia
 B.A. 1954, LL.B. 1956, St. John's University,
 N.Y.

Peter John Romeo, Virginia
 B.S. in B.A. 1964, Georgetown University
 J.D. 1967, George Washington University
 James Garrett Tigner, Virginia
 B.S. 1961, New Mexico State University
 LL.B. 1965, Baylor University
 Matthew Joseph Wheeler, Jr., Illinois
 B.S. 1961, Loyola University, Ill.
 LL.B. 1964, John Marshall Law School
 Donald Ray Wilson, Virginia
 B.A. 1960, LL.B. 1964, University of Missouri

MASTER OF COMPARATIVE LAW

Norihiro Takeuchi, Japan
 B.A. 1960, Tokyo University of Foreign Studies,
 Japan
 LL.M. 1962, Hitotsubashi University, Japan

Oung Myint Tun, Virginia
 B.A. 1956, LL.B. 1960, Rangoon University,
 Burma

DOCTOR OF JURIDICAL SCIENCE

John Luis Antonio de Passalacqua, Virginia
 International Law
 Dissertation: *A Study of Intervention in Public International Law*
 B.A. 1961, University of Puerto Rico
 LL.B. 1964, Catholic University of Puerto Rico
 LL.M. 1965, George Washington University

DEGREES CONFERRED, SEPTEMBER 30, 1969

JURIS DOCTOR

Richard Lee Ballantyne, District of Columbia
 (With Honors)
 B.S.E. 1965, M.B.A. 1967, University of
 Connecticut
 John Moore Blish, Virginia
 B.A. 1966, George Washington University
 William Joseph Bonner, Virginia
 B.A. 1961, Phillips University
 Jeffrey Knight Brinck, District of Columbia
 (With Honors)
 B.A. 1962, Dartmouth College
 M.S. 1964, Stanford University
 David Springer Brown, Jr., Virginia
 B.A. 1966, Syracuse University
 Arnold David Bruckner, Maryland
 B.B.A. 1964, George Washington University
 Martha Edyth Bryan, Virginia
 (With Honors)
 B.A. 1966, Brenau College
 James Craig Carman, Virginia
 B.S. 1966, University of Utah
 George Edwin Christopher, Maryland
 B.S. 1952, University of Maryland
 Daniel John Clement, Pennsylvania
 (With Honors)
 B.S. 1965, Pennsylvania State University
 William Edwin Crews, Ohio
 (With Honors)
 B.A. 1966, Miami University
 Philip Douglas Dickinson, Maryland
 B.A. 1966, Franklin and Marshall College
 Heather Strachan Foley, District of Columbia
 B.A. 1961, Pembroke College

Edward Ronald Freedman, Tennessee
 B.S.E. (Ch.E.), B.S.E. (Met.E.) 1966, University
 of Michigan
 Mark David Graubard, New York
 B.A. 1966, State University of New York at
 Binghamton
 Howard Ruggles Green II, Hawaii
 (With Honors)
 B.A. 1964, University of California, Berkeley
 Richard Joseph Ham, Maryland
 B.A. 1966, George Washington University
 Alan Raymond Harter, Virginia
 (With Honors)
 B.S. 1958, Utah State University of Agriculture
 and Applied Science
 Carol Theresa Hawkins, Hawaii
 B.A. 1966, Skidmore College
 Gilbert Hall Hennessey III, District of Columbia
 (With Honors)
 B.A. 1966, Beloit College
 Albert Anthony Kashinski, Virginia
 B.A. 1963, B.S. 1964, University of Notre Dame
 Charles Melvin Leedom, Jr., District of Columbia
 (With Honors)
 B.S. 1966, Purdue University
 Samuel Michael Levin, Virginia
 B.A. 1966, George Washington University
 Lawrence Alexander Morrison, Virginia
 B.A. 1960, George Washington University
 Raymond Pardo Niro, Virginia
 (With Honors)
 B.S. 1964, University of Pittsburgh

George Pappas, Illinois
 B.S. 1966, Carroll College, Wis.
 Joseph Raymond Roberts, Pennsylvania
 B.A. 1962, Pennsylvania State University
 M.A. 1967, George Washington University
 Alton Douglas Rollins, Virginia
 (With Highest Honors)
 B.S. 1961, American University
 John Hollister Stein, District of Columbia
 B.A. 1964, Yale University
 Alan James Stone, Illinois
 B.A. 1966, Miami University
 Samuel J. Sutton, Virginia
 (With Honors)
 B.A. 1964, B.S. in E.E. 1967, University of
 Arizona

Donald William Thomas, Virginia
 (With Honors)
 B.S. in E.E. 1953, University of Iowa
 Thomas Norton Tureen, Maine
 B.A. 1966, Princeton University
 Tonita Minge Warren, District of Columbia
 B.A. 1966, Westhampton College
 Electra Catsonis Wheatley, Maryland
 (With Honors)
 B.A. 1955, Pennsylvania State University
 Glenn Allen White, Virginia
 (With Honors)
 B.A. 1966, DePauw University
 John Small Winder, Jr., District of Columbia
 B.A. 1966, University of Michigan

MASTER OF LAWS

Joseph Laurie Battle, Alabama
 Labor Law
 LL.B. 1967, University of Alabama
 Robert Christopher Boasberg, Jr., New York
 Public International and Comparative Law
 B.S. in B.A. 1962, Georgetown University
 LL.B. 1965, State University of New York at
 Buffalo
 William Abraham Crane, Ohio
 Public International and Comparative Law
 B.A., J.D. 1960, Ohio State University
 James Gordon Gidding, Maryland
 Taxation
 B.S. in F.S. 1943, Georgetown University
 M.A. 1948, Ohio State University
 LL.B. 1950, University of Virginia
 David Rogers Hendrick, Jr., Texas
 B.A. 1965, LL.B. 1967, Baylor University
 Charles Frederick Hite, Pennsylvania
 B.S. 1960, Pennsylvania State University
 LL.B. 1963, Georgetown University
 William Kegel Hogan, Wyoming
 Taxation
 B.A. 1962, Georgetown University
 J.D. 1965, Hastings College of the Law
 Stuart Everett Kaufman, New York
 B.A. 1965, New York University
 J.D. 1968, George Washington University
 Edward Glen Ketchen, Jr., Maryland
 B.S. in I.E. 1963, J.D. 1968, University of
 Tennessee
 Jerome Neil Kline, Maryland
 B.S. 1965, Pennsylvania State University
 J.D. 1968, Villanova University
 Walter William Krieger, Jr., Kentucky
 Public International and Comparative Law
 (With Highest Honors)
 B.A. 1959, Bellarmine-Ursuline College
 LL.B. 1962, University of Louisville
 Raymond Everett Lisle, District of Columbia
 (With Highest Honors)
 B.S. in S.S. 1929, City College, New York
 M.A. 1930, Columbia University
 J.D. 1936, New York University

Richard Lee Marlar, Virginia
 Taxation
 B.S. 1956, University of Oklahoma
 J.D. 1963, American University
 Henry John McGurran, District of Columbia
 B.A. 1965, J.D. 1968, University of Arizona
 Michael Maulsby Moore, Virginia
 Public International and Comparative Law
 B.A. 1961, LL.B. 1964, University of
 Washington
 Thien Koan Ng, California
 Taxation
 B.B.A. 1965, M.B.A. 1967, J.D. 1968, Golden
 Gate College
 John Kenneth Pruellage, Virginia
 Taxation
 B.S. in Com. 1962, St. Louis University
 J.D. 1965, University of Missouri
 Clifford Lee Reeves, District of Columbia
 Public International and Comparative Law
 B.A. 1966, J.D. 1968, University of Alabama
 John Norick Schaefer, Maryland
 B.B.A. 1963, University of Oklahoma
 LL.B. 1966, University of Texas at Austin
 Howard Roger Warwick, Jr., Texas
 Public International and Comparative Law
 B.S. 1960, University of Houston
 LL.B. 1962, Southern Methodist University
 Paul Alexander Wille, District of Columbia
 B.A. 1956, Lake Forest College
 J.D. 1959, University of Chicago
 Douglas Jerome Wold, Montana
 Taxation
 B.S. 1963, LL.B. 1965, University of Montana
 Raymond Lester Wolitz, Virginia
 (With Highest Honors)
 B.A. 1965, Queens College, N.Y.
 J.D. 1968, New York University

DOCTOR OF JURIDICAL SCIENCE

John Hayes Reese, Colorado
 Administrative Law
 Dissertation: *Power-Policy People: A Study of Driver Licensing Administration*
 B.B.A., LL.B. 1954, Southern Methodist University
 LL.M. 1965, George Washington University

WINTER CONVOCATION, FEBRUARY 21, 1970

JURIS DOCTOR

Student Marshal: Kieron Finian Quinn

- Richard Alan Appelbaum, Florida
(With Honors)
B.S. 1961, U.S. Coast Guard Academy
- Richard Pearce Arnold, Virginia
B.A. 1967, Indiana University of Pennsylvania
- Gerald Edgar Baker, Maryland
B.A. 1962, North Park College and Theological Seminary
- M.A.T. 1964, Northwestern University
- Gary Michael Baxter, District of Columbia
B.S. 1967, Arizona State University
- Steven Ross Bechtel, Florida
(With Honors)
B.A. 1967, Tulane University of Louisiana
- Patricia Louise Brown, Maryland
(With Honors)
B.A. 1966, George Washington University
- Charles Pollard Cocke, Virginia
B.S. in Com. 1965, University of Virginia
- Alan Edward D'Appolito, Maryland
(With Honors)
B.A. 1967, University of Maryland
- Jo Benson Fogel, Maryland
B.A. 1966, Duke University
- Don Louis Harding, Idaho
B.B.A. 1964, George Washington University
- William Harold Hodge, Maryland
(With Honors)
B.S. in E.E. 1963, University of Arkansas
- M.S. in E.E. 1965, University of New Mexico
- John David Holum, District of Columbia
(With Honors)
B.S. 1963, Northern State College
- Susan Jennifer Johnson, District of Columbia
B.S. 1963, University of Pennsylvania
- Edward Joel Kessler, Virginia
B.S. (E.E.) 1967, George Washington University
- Richard Allen Killworth, Virginia
(With Honors)
B.S. 1965, M.A. 1966, Purdue University
- Daryll Norman Love, District of Columbia
(With Honors)
B.A. 1963, University of Minnesota
- Joseph Raymond Lundy, Illinois
(With Honors)
B.A. 1962, Princeton University
- John James Pagano III, Maryland
B.A. 1967, Bucknell University
- Harry Lee Ponder III, District of Columbia
B.A. 1964, University of Arkansas
- Kieron Finian Quinn, District of Columbia
(With Honors)
B.S. in F.S. 1963, Georgetown University
- Billy Wayne Richardson, Virginia
(With Honors)
B.S. 1963, U.S. Coast Guard Academy
- Victor Siber, Virginia
B.E.E. 1964, Pratt Institute
- M.S. 1966, Rensselaer Polytechnic Institute
- Gary Audric Smith, Maryland
B.A. 1967, University of Maryland
- John M. Stuckey, Jr., Virginia
(With Honors)
B.A. 1961, M.A. 1963, Louisiana State University
- William Hugh Townsend, New York
B.A. 1963, University of North Carolina at Chapel Hill
- M.B.A. 1965, Syracuse University
- Tyson Wade Whiteside, Virginia
B.A. 1966, University of Kansas

MASTER OF LAWS

- John David Atlas, New Jersey
B.A. 1965, University of Miami
- LL.B. 1968, Boston University
- James Baird, Virginia
Labor Law (With Highest Honors)
- B.A. 1965, Michigan State University
- J.D. 1968, University of Wisconsin
- Richard Sanford Becker, District of Columbia
(With Highest Honors)
B.A. 1964, Miami University
- J.D. 1967, University of Michigan
- Marshall Fox Berman, Virginia
Labor Law (With Highest Honors)
- B.A. 1961, University of Virginia
- J.D. 1967, American University
- David Ellis Blabey, New York
B.A. 1965, Hamilton College
- J.D. 1968, Cornell University
- Harvey Samuel Brosler, Virginia
Government Procurement Law
- B.S. 1959, University of Connecticut
- LL.B. 1966, Eastern College
- J. Winston Bryant, Arkansas
B.A. 1960, Ouachita Baptist University
- LL.B. 1963, University of Arkansas
- Michael Allen Collora, Pennsylvania
(With Highest Honors)
B.A. 1965, University of Virginia
- LL.B. 1968, Harvard University
- Fronefield Crawford, Jr., District of Columbia
B.A. 1965, Williams College
- LL.B. 1968, Yale University
- Roger Henry Dusberger, Illinois
B.S. 1964, J.D. 1966, University of Illinois
- Richard Lapsley Griffin, Virginia
Taxation
- B.S. 1950, LL.B. 1952, University of North Carolina at Chapel Hill
- M.B.A. 1968, Inter-American University of Puerto Rico
- Radwan A. Jabri, Virginia
Public International and Comparative Law
(With Highest Honors)
- LL.B. 1965, University of Aleppo, Syria
- M.C.L. 1968, University of Miami

John Bennett Jones-Bateman, New York
(With Highest Honors)
B.S. 1955, U.S. Coast Guard Academy
LL.B. 1968, University of Maryland
Anis Fowzi Kassim, District of Columbia
Public International and Comparative Law
(With Highest Honors)
License in Law 1965, University of Damascus,
Syria
M.C.L. 1968, University of Miami
James John Keightley, Virginia
Taxation
B.A. 1964, Villanova University
LL.B. 1967, Cornell University
David Lee Mahan, Maryland
B.A. 1963, University of Kentucky
LL.B. 1966, Indiana University
Bruce Lowry McDonald, Maryland
Administrative Law: Economic Regulation
(With Highest Honors)
B.A. 1963, LL.B. 1966, Harvard University

John Sanders Miller III, New York
Government Procurement Law
B.A. 1959, Hamilton College
LL.B. 1962, University of Virginia
Richard Paul Noland, Texas
B.A. 1965, J.D. 1966, University of Texas at
Austin
Joseph Michael Quinlan, New York
B.S.S. 1963, Fairfield University
J.D. 1966, Fordham University
Eric Scott Sirulnik, Massachusetts
B.A. 1965, Franklin and Marshall College
J.D. 1968, Boston University
Richard William Tomeo, Virginia
Taxation
B.A. 1963, LL.B. 1966, University of
Connecticut

MASTER OF COMPARATIVE LAW

Joselito Bucoy de Leon, Virginia
B.A. 1962, Ateneo de Zamboanga, Philippines
LL.B. 1966, Ateneo de Manila, Philippines

MASTER OF COMPARATIVE LAW (American Practice)

Leonardo Luis Bravo, Maryland
Doctor of Civil Law 1942, University of
Havana, Cuba

Jorge Fernandez, Virginia
Doctor en Derecho 1952, University of Havana,
Cuba

DOCTOR OF JURIDICAL SCIENCE

Kuang-Hsung Joseph Chuang, Maryland
International Trade
Dissertation: *A Composite Study of Legal Aspect to Investment in China (Republic of),
Japan, Korea (Republic of), and Philippines*
LL.B. 1964, Soochow University, Taiwan
LL.M. 1966, Chung-Hsing University, Taiwan
LL.M. 1968, University of California, Berkeley

Students Registered, Spring Semester 1970

STUDENTS REGISTERED IN THE JURIS DOCTOR PROGRAM

A			
Aber, Gary W.			
B.S. 1969, University of Delaware	Md.	Aglietti, Terry C.	Va.
Abrams, Donald L.		B.A. 1967, Texas A&M University	
B.S. in F.S. 1969, Georgetown University	Conn.	Albert, Larry J.	Md.
Abrams, Robert G.		B.A. 1964, George Washington University	
B.A. 1968, Colgate University	N.J.	Alexander, Robert D.	N.Y.
Acey, Thomas E., Jr.		B.A. 1968, Queen's College, N.Y.	
B.A. 1969, George Washington University	Va.	Alfano, Alphonse M.	N.J.
Achilles, Norman L.		B.A. 1969, University of Pittsburgh	
B.S. in C.E. 1957, Carnegie-Mellon University	D.C.	Altman, Robert A.	D.C.
M.B.A. 1962, Harvard University		B.A. 1968, University of Wisconsin	
Adise, Stephen Z.		Ambush, Richard H.	N.Y.
B.A. 1969, Franklin Pierce College	N.Y.	B.A. 1968, Case Western Reserve University	

Ament, Warren W.	Mich.	Appel, Richard J.	Mich.
B.A. 1963, University of Michigan		B.A. 1968, Central Michigan University	Va.
Anderson, David T.	Ohio	Arfa, Richard S.	
B.S. 1963, University of Cincinnati		B.A. 1967, Hunter College	Md.
Anderson, Russell D.	Va.	Armstrong, Brent R.	
B.S. 1969, University of Maryland		B.A. 1967, Brigham Young University	Texas
Andewelt, Roger B.	Va.	Arno, James A.	
B.S. 1967, Brooklyn College		B.A. 1964, Ph.D. 1968, University of Texas at Austin	Md.
Annis, Alan S.	Mass.	Atlas, David R.	
B.S. in B.A. 1969, Northeastern University		B.E. 1968, Cooper Union	Wyo.
Anspacher, John M.	Md.	Austin, John A.	Calif.
B.A. 1969, Dickinson College		B.A. 1968, Johns Hopkins University	
Aoki, Paul S.	Hawaii	Ayer, Roger H.	
B.A. 1969, University of Hawaii		B.S. in F.S. 1968, Georgetown University	

B

Babcock, William L., Jr.	Del.	Begelman, Robert P.	Md.
B.A. 1969, Bowdoin College		B.S. in B.A. 1968, Ohio State University	Va.
Bailey, Willie L.	Miss.	Beha, William H., Jr.	N.Y.
B.A. 1969, Tougaloo College		B.S. in E.E. 1961, University of South Carolina	
Baime, Barry L.	Va.	Bell, Marilyn B.	Tenn.
B.A. 1969, Rutgers, the State University		B.A. 1967, Boston University	
Ball, Gregory D.	Ind.	Bell, Ralph L.	N.J.
B.A. 1967, Wabash College		B.S. in B.A. 1961, American University	
Balmer, Norman L.	Va.	Bellman, Steven I.	Va.
B.S. 1968, Pennsylvania State University		B.A. 1968, George Washington University	
Banov, Alan	S.C.	Bello, Richard A.	N.J.
B.A. 1967, University of North Carolina at Chapel Hill		B.A. 1967, New York University	
Banta, Richard J.	Mich.	Bennett, Robert P.	Md.
B.A. 1969, University of Michigan		B.A. 1967, Rutgers, the State University	
Bantleon, David F.	N.Y.	Berg, Barry S.	Va.
B.A. 1968, University of Rochester		B.B.A. 1969, George Washington University	
Barkley, Brian E.	Md.	Berg, Raymond C.	N.Y.
B.A. 1967, University of Maryland		B.A. 1962, University of Maine	
Barnes, Donald M.	Wash.	Berger, Bradley I.	Mass.
B.S. in I.E. 1965, Pennsylvania State University		B.A. 1969, City College, New York	
Barnes, Michael D.	Md.	Berger, Marshall K., Jr.	Md.
B.A. 1965, University of North Carolina at Chapel Hill		B.A. 1969, University of Vermont	
Barney, Robert S.	Mo.	Berger, Melvin G.	Ill.
B.S. in Ed. 1964, Southeast Missouri State College		B.S. 1965, City College, New York	
Barr, Charles H.	Md.	M.S. 1967, New York University	
B.A. 1959, M.A. 1966, University of Washington		Berkson, Dennis A.	Ky.
Barrack, Donald J.	Md.	B.A. 1969, University of Wisconsin	
B.S. 1967, Columbia University		Berlin, Mark L.	Mich.
Basheer, Baheej W.	Md.	B.A. 1969, Northwestern University	
B.S. 1965, U.S. Air Force Academy		Berman, Joel S.	D.C.
Basile, Edward M.	D.C.	B.A. 1967, Tufts University	
B.S. 1969, Lafayette College		Berns, Sharon-Lee	Md.
Bassman, Robert S.	N.J.	B.A. 1968, George Washington University	
B.A. 1969, University of Pittsburgh		Bernstein, Sidney T.	N.Y.
Baxter, Thomas A.	Ind.	B.B.A. 1966, University of Miami	
B.A. 1968, Purdue University		Bernthal, Eric L.	Wis.
Bayer, Mark A.	Fla.	B.A. 1967, Columbia University	
B.A. 1969, Michigan State University		Berres, John R.	Va.
Beadles, James C.	Md.	B.S. in E.E. 1969, University of Notre Dame	
B.A. 1969, George Washington University		Beus, Edwin H.	W.Va.
Beard, R. Richardson	D.C.	B.A. 1966, Brigham Young University	
B.B.A. 1966, George Washington University		Bibb, Edgar E.	N.Y.
Beaver, Richard J.	Va.	B.A. 1969, Georgetown University	
B.S. 1964, U.S. Coast Guard Academy		Billig, Ronda L.	Md.
Bechtold, William M.	Del.	B.A. 1969, George Washington University	
B.S. in B.A. 1968, Georgetown University		Binder, Jeffrey I.	N.C.
Beecher, Robert M.	N.Y.	B.A. 1968, Drake University	
B.A. 1969, University of Wisconsin		Bing, Bonnie E.	N.Y.
		B.A. 1967, George Washington University	
		Biren, Richard M.	
		B.A. 1968, George Washington University	

Birken, Joel M. B.A. 1969, George Washington University	N.Y.	Brady, Robert P. B.A. 1969, University of Rochester	Va.
Blacklow, Richard H. B.A. 1966, Dartmouth College	D.C.	Brandon, Robert M. B.A. 1969, Syracuse University	N.Y.
Blackstone, Michael C. B.A. 1964, Ohio State University	Pa.	Braunstein, Kenneth B.A. 1969, Miami University	Md.
Blair, Thomas A. B.A. 1968, George Washington University	Md.	Breitbart, Paul T. B.A. 1967, Syracuse University	N.Y.
Blanchard, Daniel S. B.A. 1965, Princeton University	Va.	Brezine, Donald F. B.A., Ph.L. 1959, Th.L. 1966, Loyola University, Ill.	D.C.
Blankenbaker, Robert E. B.Ch.E. 1966, University of Virginia	Va.	Brinkerhoff, Charles R. B.A. 1969, Colorado College	N.J.
Bloch, Robert E. B.A. 1969, Franklin and Marshall College	N.J.	Broman, Herbert D. B.A. 1961, University of Maryland M.B.A. 1962, American University	Va.
Bloom, Leonard H. B.S. 1967, Cornell University	N.Y.	Brookner, Marvin A. B.A. 1967, Brown University	R.I.
Bloom, Robert T. B.A. 1967, Hofstra University	N.Y.	Brown, Bennett A. B.I.E. 1969, University of Florida	Va.
Bloomfield, Elaine L. B.A. 1967, Case Western Reserve University	Ohio	Brown, Delos E. B.A. 1968, Stanford University	Va.
Bluestein, Herman B.S. 1968, Indiana University	Va.	Brown, George S. B.A. 1969, University of Montana	Va.
Bode, William H. B.S. 1964, U.S. Air Force Academy	Mich.	Brownfield, Charles W., Jr. B.A. 1964, Miami University	Ohio
M.S. 1966, Stanford University		Bruce, Charles M. B.A. 1967, Washington and Lee University	Md.
Bogetto, Philip D. B.S. in F.S. 1965, Georgetown University	Mich.	Brummett, William R. B.A. 1968, Middlebury College	Conn.
Bomze, Jay L. B.A. 1968, George Washington University	Pa.	Bucholtz, Roy J. B.A. 1967, University of Virginia	Va.
Bonnett, Gary B. B.A. 1968, Lafayette College	Md.	Buck, Robert W. B.A. 1967, Oklahoma City University	Pa.
Booth, Richard S. B.A. 1968, Amherst College	N.Y.	Budow, Michael J. B.A. 1968, University of Wisconsin	N.Y.
Bortner, Richard B. B.A. 1968, Yale University	Md.	Buker, Gerold A., Jr. B.A. 1965, Boston College	Mass.
Borwick, Rodney J. B.A. 1967, American University	Colo.	Bullock, Charles E. B.A. 1968, Bucknell University	N.Y.
Boswell, James E. B.A. 1968, Drake University	Md.	Burch, Richard K. B.A. 1966, Wichita State University	Va.
Boswell, Robert C. B.A. 1966, LaSalle College	Md.	Burchill, William R., Jr. B.A. 1969, University of Pennsylvania	Va.
Boucree, Catherine M. B.S. 1965, D.C. Teachers College	Md.	Burgee, Michael B. B.A. 1968, University of Virginia	Pa.
Bovee, Warren R. B.E. 1965, Vanderbilt University	Wis.	Burk, Francis L., Jr. B.A. 1965, Dartmouth College	Va.
Bowen, Alanson G., Jr. B.S. 1962, Rensselaer Polytechnic Institute	Va.	Burkholder, Evan A. B.A. 1968, Hanover College	Va.
Bowen, William G. B.S. 1966, U.S. Air Force Academy	Va.	Bustard, Robert D. B.A. 1968, Dartmouth College	Pa.
M.A. 1967, Georgetown University		Butler, William F. B.A. 1968, College of the Holy Cross	Mass.
Bowers, Jonathan S. B.A. 1967, University of Michigan	Mich.	Byrd, Charles F. B.S. in B.A. 1967, Wayne State University	Mich.
Bowers, Peter C. B.A. 1969, Pennsylvania State University	Pa.	Byrd, Richard J. B.E.E. 1960, George Washington University	Va.
Bozonelis, Basil T. B.A. 1967, Rutgers, the State University	N.J.	Bywater, Douglas E. B.S. 1967, University of Utah	Va.
Bradford, Merrill R., Jr. B.A. 1968, Washington and Lee University	Maine		
Brady, Dennis C. B.S. 1964, Fordham University	D.C.		
Cable, William H. B.S. 1967, University of Wisconsin	D.C.	Canoyer, Mark R. B.B.A. 1966, Ohio University	Ohio
Calderwood, James A. B.S. 1964, University of Maryland	Md.	Capelli, John J., Jr. B.A. 1969, Providence College	D.C.
Campagna, Joseph A., Jr. B.A. 1967, University of Virginia	Va.	Caputo, Ralph V. B.A. 1966, Georgetown University	N.Y.
Campbell, Austin B. B.S. 1962, Ohio State University	N.C.	Carls, Harry W. B.A. 1969, American University	Fla.

Carlson, Erik B.	Pa.	Clyman, Jeffrey M.	N.Y.
B.A. 1969, Dartmouth College		B.A. 1967, University of Vermont	Ind.
Carlson, Jay L.	Wis.	Coblentz, John E.	
B.S. 1965, University of Wisconsin		B.S. 1965, U.S. Air Force Academy	N.Y.
Carosella, Michael E.	Italy	M.A. 1966, Georgetown University	
B.S. (M.E.) 1966, George Washington University		Cogan, Robert P.	N.J.
Carr, James F.	Mich.	B.E. 1966, Cooper Union	
B.S. 1968, U.S. Air Force Academy		Cohen, Alan L.	Pa.
Carson, William S.	Va.	B.A. 1969, University of Rochester	
B.S. in Engr. 1969, Brown University		Cohen, Arthur J.	N.Y.
Carter, David M.	Ky.	B.A. 1967, Franklin and Marshall College	
B.S. 1968, Western Kentucky University		Cohen, Edward B.	N.Y.
Carter, Francis D.	D.C.	B.S. 1967, Lehigh University	
B.A. 1968, Villanova University		Cohen, Frederic A.	N.Y.
Carwell, Keith M.	Ky.	B.A. 1968, City College, New York	
B.A. 1969, Western Kentucky University		Cohen, Harold J.	N.Y.
Cathcart, Kerry L.	Iowa	B.A. 1967, State University of New York at Binghamton	
B.A. 1967, Drake University		Cohen, Richard A.	Va.
Chambers, Joy B.	Ala.	B.S. 1968, Cornell University	
B.A. 1968, George Washington University		Cohen, Richard S.	Va.
Chandler, James G.	Va.	B.A. 1968, Rutgers, the State University	
B.A. 1967, Duke University		Cohen, Sharon G.	N.Y.
M.A. 1968, University of Kentucky		B.A. 1968, Rutgers, the State University	
Chapman, Cheryl H.	D.C.	Cohen, Stuart R.	N.Y.
B.A. 1969, Boston University		B.S. 1967, Brooklyn College	
Chapuran, Ronald F.	Va.	Cohn, Lawrence H.	Ill.
B.E.E. 1960, Marquette University		Coleman, James R.	Pa.
Chen, William J., Jr.	Md.	B.A. 1968, University of Illinois	
B.A. 1966, American University		Collins, Alfred G.	Md.
Chiplin, Alfred J., Jr.	Miss.	B.S. 1968, Pennsylvania State University	
B.A. 1969, Tougaloo College		Collins, Lynn R.	Mass.
Chomski, Joseph M.	N.Y.	B.S. 1964, Brigham Young University	
B.A. 1967, George Washington University		Collins, Mark T.	Va.
Chopp, Harvey J.	Mass.	B.S. 1969, Georgetown University	
B.A. 1965, Providence College		Colten, Richard J.	N.J.
Christensen, Krege B.	Va.	B.S. 1966, American University	
B.S. 1965, M.B.A. 1967, University of Utah		Conchar, Barton C.	Va.
Christison, Kenneth M.	Md.	B.A. 1968, University of Richmond	
B.S. 1964, Montana State University		Condit, Thomas S.	Va.
M.A. 1967, George Washington University		B.A. 1964, Stanford University	
Chronister, Allen B.	Va.	Connelly, Christine	N.J.
B.A. 1969, University of North Carolina at Chapel Hill		B.A. 1969, Dunbarton College of Holy Cross	
Chung, Edmund M.	Mich.	Conti, Richard A.	D.C.
B.E.E. 1965, M.B.A. 1967, University of Detroit		B.A. 1967, Merrimack College	
Cinciotta, Linda A.	Md.	Conway, Frederic L.	Va.
B.S. 1965, Georgetown University		B.A. 1969, University of Massachusetts	
Cinnamond, William G.	Vt.	Cook, Joseph T.	N.J.
B.A. 1969, University of Vermont		B.S. 1963, U.S. Naval Academy	
Clark, George E.	N.Y.	Cooke, Jay C.	Colo.
B.S. 1964, University of Arizona		B.S. 1969, Ohio University	
Clark, John A., III	Del.	Coombe, John D.	Md.
B.A. 1968, Fordham University		B.A. 1968, Williams College	
Clark, Robert M.	Calif.	Cooper, Barry A.	Ala.
B.A. 1961, San Diego State College		B.A. 1966, City College, New York	
Clark, William F.	Conn.	Cooper, Peggy A.	Mo.
B.A. 1969, Drew University		B.A. 1968, George Washington University	
Clarke, Jean M.	Va.	Cooperman, Ruth E.	Ill.
B.A. 1968, Transylvania College		B.A. 1969, Barnard College	
Clarkson, Charles M.	D.C.	Copeland, Richard Z.	Md.
B.A. 1967, Princeton University		B.B.A. 1969, University of Wisconsin	
Clarkson, Patricia H.	N.Y.	Corbin, Arthur L.	Mass.
B.A. 1961, Smith College		B.S. in Ch.E. 1969, University of Maryland	
Clary, Matthew A., III	Va.	Corcoran, Richard B.	N.Y.
B.A. 1968, Johns Hopkins University		B.S. in Ed. 1969, University of Vermont	
Cleland, John M.	Va.	Cornelius, Richard M.	Calif.
B.A. 1967, Denison University		B.A. 1969, American University	
Clements, Daniel M.	N.Y.	Cornell, Dennis A.	
B.A. 1968, University of Pennsylvania		B.A. 1969, Stanford University	

Cornell, Robert B. B.A. 1967, Bates College M.A. 1969, University of Glasgow, Scotland	Conn.	Cronin, John P. B.A. 1969, George Washington University	Mass.
Corriero, Marianne B.A. 1965, Mills College	N.Y.	Crow, Elisabeth N. B.A. 1968, Mount Holyoke College	France
Courtney, Robert E. B.A. 1968, College of the Holy Cross	Va.	Crumrine, Clarence A. B.A. 1967, Washington and Jefferson College	Va.
Coven, Edward M. B.S. in M.E. 1969, Purdue University	Ind.	Crystal, Robert G. B.A. 1968, Queens College, N.Y.	N.Y.
Coy, Roderick S. B.A. 1968, Michigan State University	Mich.	Cummings, Jill B.A. 1958, Vassar College	Md.
Crabill, Michael K. B.A. 1966, Lynchburg College	Va.	Cummings, Lee B. B.A. 1969, Florida State University	Md.
Crane, John D. B.E. 1963, Yale University	Va.	Curl, Wilson B.A. 1967, University of Michigan	Mich.
Craver, Roger M. M.S.E. 1964, University of Pennsylvania	Pa.	Curtis, Clifton E. B.A. 1968, Michigan State University	Mich.
Crockett, David E., Jr. B.A. 1969, Randolph-Macon College	Va.	Curtis, Kenneth W. B.A. 1964, State University of New York at Buffalo	Va.
Cromartie, Ernest W., Jr. B.A. 1968, Michigan State University	D.C.	Czerwonky, James H. B.S. 1963, U.S. Naval Academy	Va.

D

Dahl, James G. B.A. 1961, Brigham Young University	Va.	Devries, Robert K. B.S. 1962, U.S. Military Academy	Va.
Daly, Paul M. B.A. 1968, St. Louis University	N.J.	M.S. 1965, Iowa State University of Science and Technology	
Daniels, John L. B.S. 1969, University of Utah	Md.	Dewald, Ronald G. B.A. 1967, Miami University	Md.
Daniels, Lawrence P. B.A. 1965, Kansas State College of Pittsburg	Va.	Dickinson, William W., Jr. B.A. 1968, Dickinson College	Conn.
Daniels, Robert G. B.A. 1969, University of Massachusetts	Mass.	Dinegar, Wilbur W. B.S. 1951, U.S. Naval Academy	Va.
Davenport, Robert J. B.S. 1943, U.S. Military Academy	Va.	Dion, John J. B.A. 1968, University of Notre Dame	Mass.
Davis, M.A. in I.A. 1961, George Washington University		Distler, Ann S. B.A. 1969, Purdue University	Ind.
Davidson, Donald R. B.A. 1968, Dartmouth College	N.Y.	Dixon, Arrington L. B.A. 1966, Howard University	D.C.
Davidson, Douglas E. B.S. in F.S. 1968, Georgetown University	N.J.	Dobkin, Judith F. B.A. 1965, University of Wisconsin	Ill.
Davis, Drew M. B.A. 1969, Roanoke College	N.J.	Dohnal, Dennis W. B.A. 1967, Bucknell University	Ohio
Davis, Gary V. B.A. 1968, American University	Va.	Donohoe, Charles R. B.E.E. 1964, M.S. 1965, Ohio State University	Ohio
Davis, Ulysses B.A. 1953, University of Iowa	Conn.	Dooling, Thomas A. B.A. 1964, Harvard University	D.C.
Day, Robert E. M.S. 1962, University of Bridgeport		Dorian, Linda C. B.A. 1968, University of Maryland	Md.
Deal, David T. B.C.E. 1966, Villanova University	Md.	Dorland, Harold H. B.S. 1960, University of Minnesota	Md.
Dearing, Dennis A. B.S. 1968, Western Kentucky University	Va.	Dorris, Thomas B. B.A. 1964, Princeton University	Ind.
Decrescente, Leo B. B.S. 1967, Clarkson College of Technology	N.Y.	Dorsch, Nancy R. B.A. 1953, Smith College	D.C.
Decuir, Robert D. B.S. 1969, University of Maryland	D.C.	Ed.M. 1955, University of Pittsburgh	
Defour, Brian M. B.A. 1968, Georgetown University	Va.	Dorsey, John C. B.S. 1968, Wittenberg University	Ohio
Deisinger, William R. B.A. 1968, Gettysburg College	N.J.	Dougherty, Alfred F., Jr. B.S. 1963, U.S. Naval Academy	D.C.
Denny, Judith A. B.A. 1968, Louisiana Polytechnic Institute	La.	Douglass, Alvin G., Jr. B.S. in F.S. 1968, Georgetown University	D.C.
Dentel, Robert R. B.A. 1968, Georgetown University	Pa.	Douglass, Paul W. B.A. 1969, University of California, Santa Barbara	Calif.
Desmuke, Robert A. B.A. 1963, California State College at Los Angeles	Va.	Dowell, Alvis Y. B.A. 1965, Williams College	Va.

Draisin, Stephen J.	D.C.	Duncan, Jerrome N.	N.Y.
B.A. 1969, George Washington University		B.A. 1969, Lincoln University, Pa.	Va.
Drisko, Diana M.	Kans.	Duncan, John J., Jr.	
B.A. 1967, Northwestern University		B.S. 1969, University of Tennessee	N.Y.
Duboff, Joel	N.Y.	Dunn, Charles C.	N.Y.
B.A. 1968, Queens College, N.Y.		B.A. 1965, University of Notre Dame	N.Y.
Dublin, Kirk A.	D.C.	Dunsay, Jessica A.	
B.A. 1968, Oakland University		B.A. 1968, George Washington University	Md.
Dudley, George E.	Va.	Dwimoh, Evelyn Y.	
B.S. 1969, Madison College		B.A. 1968, Howard University	Conn.
Duffield, Edward H.	Md.	Dworkin, Michael L.	
B.S.E. 1965, University of Michigan		B.A. 1969, Clark University	Wash.
Dugger, John A.	D.C.	Dwyer, Michael D.	
B.S. 1945 U.S. Naval Academy		B.A. 1969, University of Washington	
M.A. 1960, American University			

E

Earl, William J.	N.C.	Efroymson, Mary A.	Ind.
B.A. 1969, Morehouse College		B.A. 1965, Wellesley College	N.Y.
Early, Allan B.	Va.	Ehrlich, Joseph B.	
B.A. 1967, Denison University		B.A. 1968, Syracuse University	N.Y.
Eaton, Allen T.	Va.	Eisenberg, Israel N.	
B.S. 1956, West Virginia State College		B.A. 1968, Hunter College	N.J.
Echter, Martin S.	Conn.	Eisler, Beth A.	
B.A. 1964, Dartmouth College		B.A. in Ed. 1968, George Washington University	Md.
Edelstein, Janice A.	N.J.	Ekstrand, Richard E.	
B.A. 1964, Smith College		B.A. 1969, University of Maryland	Va.
Edgar, Cynthia G.	D.C.	Elliott, Robert C.	
B.A. 1968, Wheaton College		B.A. 1968, George Washington University	N.Y.
Edgar, George L.	Fla.	Elson, Barry R.	
B.A. 1963, B.M.E. 1964, Dartmouth College		B.S. 1967, New York University	N.Y.
Edwards, Johnny P.	D.C.	Emanuel, Richard	Iowa
B.A. 1964, Washington and Lee University		B.A. 1967, University of Connecticut	
Edwards, Monte R.	Md.	Erhardt, J. William	Pa.
B.S. in M.E. 1967, University of Maryland		B.A. 1969, George Washington University	
Edwards, Thomas C.	Calif.	Eskovitz, Jay N.	
B.A. 1968, University of California, Los Angeles		B.S. in I.E. 1969, Purdue University	D.C.
Efroymson, Daniel R.	Md.	Evans, Pamela B.	
B.A. 1963, Harvard University		B.A. 1967, Smith College	

F

Fagin, Darryl H.	Md.	Finegold, Sharon A.	D.C.
B.A. 1968, Olivet College		B.A. 1967, University of California, Berkeley	Pa.
Farnham, Steven K.	Mass.	Fineman, S. David	
B.A. 1969, Wesleyan University		B.A. 1967, American University	D.C.
Farquhar, Elizabeth H.	D.C.	Fingerhut, Michael B.	Pa.
B.A. 1961, Guilford College		B.A. 1968, George Washington University	
Fasanella, George M.	Conn.	Fiori, Patricia A.	D.C.
B.A. 1969, Boston College		B.A. 1967, Goucher College	
Fay, Donald J.	N.J.	Fiscina, Salvatore F.	
B.A. 1968, Mount St. Mary's College, Md.		B.A. 1963, Harvard University	N.J.
Feinberg, Peter H.	N.Y.	M.D. 1967, University of Rochester	
B.A. 1969, New York University		Fishman, Theodore V.	Va.
Feinstein, Howard L.	Va.	B.A. 1968, George Washington University	
B.A. 1968, University of California, Santa Barbara		Fitzmorris, Kevin T.	Ky.
Fernandez, Gary R.	D.C.	B.A. 1967, Georgetown University	
B.A. 1968, University of Maryland		Fleischaker, Marc L.	Va.
Ferri, Albert	N.J.	B.S. 1967, University of Pennsylvania	
B.A. in Govt. 1964, George Washington University		Foelak, Morton	D.C.
M.A. 1970, Boston University		B.S. 1953, Brooklyn College	
Ferris, Gregory G.	Va.	Fogelberg, Carl R.	N.Y.
B.A. 1967, University of North Carolina at Chapel Hill		B.A. 1963, Dartmouth College	
Feuerzeig, Henry L.	Md.	Foote, Francis W., II	Md.
B.S. 1962, University of Wisconsin		B.A. 1967, Washington and Lee University	
		Foran, John R.	
		B.A. 1968, University of Maryland	

Forburger, Dean C. B.A. 1966, University of Michigan	Mich.	Freed, David A. B.S. 1969, Arizona State University	N.Y.
Forman, Mark A. B.S. 1967, Pennsylvania State University	N.J.	Freedman, Theodore L. B.A. 1969, University of Connecticut	Conn.
Forman, Stephen B. B.S. 1962, Queens College, N.Y.	Va.	Freishchlag, Mark D. B.A. 1968, University of Rochester	D.C.
B.S. 1962, M.S.(M.E.) 1963, Columbia University		French, Jay T. B.A. 1965, Yale University	D.C.
Fortunato, Stephen J. B.A. 1965, Providence College	Va.	French, Philip M. B.S. 1966, Union College, N.Y.	Ohio
Fowler, Joseph M. B.A. 1969, Lehigh University	Conn.	Friedman, Dana E. B.A. 1968, University of Michigan	N.Y.
Fox, Brenda L. B.A. 1968, University of California, Los Angeles	Calif.	Friedman, Marc S. B.A. 1968, Johns Hopkins University	N.J.
Fox, Ellery S. B.A. 1969, Rutgers, the State University	N.J.	Friedman, Robert G. B.S. 1967, New York University	N.Y.
Fox, Tom W. B.S. in Ed. 1968, Ohio University	Va.	Friedman, Rodney M. B.A. 1968, Hobart College	Fla.
Frank, Paul D. B.S. in B.A. 1967, Boston University	D.C.	Friedman, Sheldon E. B.A. 1967, Miami University	Va.
Frankel, Roger L. B.A. 1968, Brandeis University	D.C.	Frischkorn, Allen R., Jr. B.A. 1967, Pennsylvania State University	Va.
Franklin, Fred J. B.A. 1968, University of Massachusetts	N.Y.	Fromme, Joseph T., II B.A. 1968, Denison University	Va.
Fredlund, Robert R., Jr. B.S. 1964, U.S. Naval Academy	Md.	Fulbruge, Charles R., III B.S. in F.S. 1968, Georgetown University	N.Y.
Freed, Charles N. B.S. 1959, Pennsylvania State University	Fla.	Fullerton, Judith A. B.A. 1966, Vassar College	Okla.
		Fulton, Daniel B.S. 1962, South Carolina State College	S.C.

G

Gailor, Frank R. B.S. 1962, South Dakota State University	Va.	Goddard, Victor B. B.A. 1969, University of Vermont	West Indies
M.P.A. 1963, Syracuse University		Gold, Stephen H.	Pa.
Gallagher, Robert P. B.A. 1968, George Washington University	Pa.	B.A. 1969, Franklin and Marshall College	Fla.
Gardner, Robert K. B.A. 1967, Brigham Young University	D.C.	Gold, Steven B. B.A. 1968, George Washington University	D.C.
Garfinkel, Steven B.A. 1967, George Washington University	Md.	Gold, Martin, Jr. B.A. 1969, George Washington University	D.C.
Garvic, John D. B.E.E. 1966, Ohio State University	Ohio	Goldberg, Steven D. B.A. 1968, University of Delaware	Del.
Gayle, David M. B.S. 1965, Case Western Reserve University	Md.	Goldberg, Theodore B.A. 1953, Brooklyn College	D.C.
M.S. 1967, Rutgers, the State University		Goldberg, Yale F. B.B.A. 1969, George Washington University	Pa.
Gebhardt, Larry J. B.A. 1968, Lehigh University	Md.	Goldman, Dennis A. B.A. 1969, George Washington University	D.C.
Gellner, Michael L. B.S. in E.E. 1969, University of Maryland	Va.	Goldman, Howard S. B.S. 1965, University of Wisconsin	N.Y.
Geltman, Edward A. B.A. 1968, Franklin and Marshall College	N.J.	Goldstein, Jerry R. B.S. 1969, University of Maryland	Md.
Gershman, Arthur B.S. in M.E. 1970, Drexel Institute of Technology	Pa.	Gonzales, John F. B.S. 1968, Louisiana State University	La.
Gewirtz, Michael I. B.A. 1969, University of Maryland	N.Y.	Gonzalez, Miguel A. B.A. 1969, Queens College, N.Y.	N.Y.
Gibbons, John M. B.S. 1962, University of Houston	Va.	Goodell, Charles P. B.A. 1969, Johns Hopkins University	Md.
Giertz, Robert G. B.S. 1968, University of Illinois	D.C.	Gordon, Alan H. B.S. 1968, Columbia University	S.C.
Gillman, Patricia N. B.A. 1968, Smith College	Maine	Gossens, Paul J. B.A. 1962, Catholic University of America	Wis.
Gilman, Nicholas B.A. 1969, University of Pennsylvania		Gourley, Tudor S., Jr. B.S. 1968, New Haven College	Va.
B.A. 1960, Stanford University	N.J.	Grabelle, Paul M. B.A. 1968, Rutgers, the State University	N.J.
Glasgow, Paul T. B.A. 1968, University of Maryland	Md.	Graber, Charles S. B.A. 1967, The Citadel	S.C.
Glennon, Elizabeth Q. B.A. 1954, Pomona College	Md.	Grabow, Michael D. B.A. 1968, George Washington University	N.J.

Grebow, Ralph H.	N.J.	Grossman, Martin L.	N.J.
B.A. 1967, George Washington University		B.S. in Econ. 1967, University of Pennsylvania	D.C.
Green, Frances M.	Ga.	Grunewald, Mark H.	Pa.
B.A. 1966, Wellesley College		B.A. 1969, Emory University	N.Y.
Green, Robert L., III	Va.	Gundel, Carol A.	N.Y.
B.A. 1967, Johns Hopkins University		B.A. 1968, Wilson College	Pa.
Greene, Joel L.	N.Y.	Gurfein, Peter J.	Fla.
B.A. 1969, Franklin and Marshall College		B.A. 1969, New York University	
Gregory, Stephen D.	Nev.	Guttman, Alan R.	
B.A. 1968, Nevada Southern University		B.S. 1969, Pennsylvania State University	
Grimm, John F.	Md.	Guttman, Steven J.	
B.S. 1961, Fordham University		B.A. 1968, University of Pittsburgh	
Gross, Edward	Ohio		
B.A. 1969, Ohio State University			

H

Haas, Steven C.	N.Y.	Hartman, Gary E.	Pa.
B.A. 1967, Syracuse University		B.A. 1968, Middlebury College	Va.
Habermann, Robert S.	Md.	Hartman, Gerald S.	N.Y.
B.A. 1969, Creighton University		B.A. 1966, M.B.A. 1968, Columbia University	D.C.
Haid, Donald J.	Va.	Harwin, Robert B.	Kans.
B.A. 1950, Emory University		B.A. 1967, Miami University	
Hall, David W.	D.C.	Hassid, Jack	Pa.
B.A. 1961, Yale University		B.A. 1967, Hofstra University	Md.
Halper, Robert	Md.	Hayden, William R.	Ky.
B.A. 1939, University of Illinois		B.A. 1969, Kansas State University of	
B.Ch.E. 1950, New York University		Agriculture and Applied Science	
M.S. in Ch.E. 1958, Newark College of		Hayes, John C.	
Engineering		B.A. 1969, Williams College	
Halpern, Melvin L.	N.Y.	Hecker, Stuart N.	
B.S. 1966, City College, New York		B.S. in E.E. 1963, University of Rhode Island	
Hamersley, James U.	Idaho	Heideman, Richard D.	
B.A. 1965, University of Utah		B.A. 1969, University of Michigan	
M.A. 1967, University of Denver		Heitman, Donald H.	
Hamm, John W.	Ohio	B.A. 1968, Georgetown University	
B.A. 1967, Denison University		Hekman, Randall J.	
Hampshire, Thomas R.	N.J.	B.S. 1969, Massachusetts Institute of	
B.S.E. 1967, Stevens Institute of Technology		Technology	
Handleman, Aaron L.	Conn.	Hellman, Kenneth A.	
B.A. 1968, Marietta College		B.A. 1969, George Washington University	
Hannaway, Edward L.	Va.	Heltzer, Lester A.	
B.S. 1966, Villanova University		B.A. 1968, Case Western Reserve University	
Hanscom, Douglas R.	D.C.	Hemmons, Alfred	
B.S. 1967, M.B.A. 1968, University of Maine		B.A. 1968, Central State University	
Hansen, John R.	Nebr.	Herderson, Nelson T.	
B.S. 1962, Iowa State University of		B.A. 1963, Ohio State University	
Science and Technology		Hendricks, Williams C., III	
M.B.A. 1964, Columbia University		B.A. 1966, University of North Carolina	
Hansen, John R.	W.Va.	at Chapel Hill	
B.A. 1965, George Washington University		Henry, Don C.	
Hanson, Bruce H.	Va.	B.A. 1968, Texas Technological University	
B.S. 1967, University of Wisconsin		Hentel, Susan	
Hanson, John N.	Wis.	B.A. 1969, Washington University	
B.A. 1967, George Washington University		Herlihy, Edward D.	
Hanssen, Henry R., Jr.	S.C.	B.A. 1969, Hobart College	
B.S. 1968, U.S. Naval Academy		Hetrick, Patrick K.	
Hargrove, Barbara J.	Md.	B.S. 1967, University of Wisconsin	
B.A. 1967, Howard University		Heyman, Michael G.	
Harris, Charles B.	Nev.	B.A. 1968, Temple University	
B.S. 1967, Nevada Southern University		Hickey, Melbie H.	
Harris, Randy A.	Ill.	B.A. 1967, Sweet Briar College	
B.A. 1967, Grinnell College		Hill, Lydia A.	
Harrison, Bruce S.	Conn.	B.S. 1958, Florida Agricultural and	
B.A. 1967, Case Western Reserve University		Mechanical University	
Hart, Thomas J.	Pa.	Hilleary, William M.	
B.A. 1967, Oberlin College		B.A. 1958, St. John's University, N.Y.	
Hartelius, Channing J.	Mont.	M.A. 1962, Fordham University	
B.A. 1968, University of Montana		Hilst, Ronald P.	
Harter, Franklin C.	Va.	B.S. 1967, University of Illinois	
B.S. in E.E. 1963, University of Michigan			

Himmelfarb, Carol L. B.A. 1968, Michigan State University	Md.	Honig, Steven M. B.A. 1968, University of Wisconsin	Wis.
Hixon, Marion L. B.A. 1962, University of San Francisco	Calif.	Howard, Jacqueline A. B.A. 1969, Spelman College	Calif.
Hoffar, Julian F. B.A. 1969, Wittenberg University	Va.	Howard, Jeffrey E. B.S. in E.E. 1964, University of Washington	Wash.
Hoffman, Gary M. B.S. in E.E. 1967, University of Pennsylvania	Pa.	Howe, Philip M. B.A. 1967, College of the Holy Cross	Mass.
Hoffman, James R. B.S. 1957, University of Tulsa	Va.	Huber, William R. B.S. 1932, U.S. Military Academy	Va.
Hoffman, John F. B.S. in E.E. 1969, University of Notre Dame	Ind.	M.B.A. 1950, University of Michigan	
Holdridge, Christopher B.A. 1964, University of Texas at Austin	Va.	Huddles, William A. B.A. 1967, Pennsylvania State University	Md.
Holland, Mark B.S. in B.A. 1967, Louisiana Polytechnic Institute	Calif.	Hume, John P. B.B.A. 1964, University of Notre Dame	Va.
M.B.A. 1969, University of Dayton		Hunt, Roger L. B.A. 1966, Brigham Young University	Va.
Holloway, Eugene C., III B.S. 1964, U.S. Naval Academy	Tenn.	Hutt, Martin J. B.A. 1967, University of Maryland	Md.
Holmes, Norman F. B.A. 1968, West Virginia University	Md.		

I

Immerman, Harry F. B.S. 1964, University of Pennsylvania	N.Y.	Itrich, James M. B.A. 1964, Beloit College	D.C.
M.B.A. 1966, University of Michigan		M.A. 1966, Rockford College	
Inouye, Ronald N. B.A. 1965, Brigham Young University	Utah	Ivory, Cecil B.A. 1969, Lincoln University, Pa.	N.C.
Isacoff, Mitchell A. B.A. 1969, Temple University	Pa.	Ivory, Susie E. B.A. 1965, Virginia Union University	D.C.

J

Jacobs, Alan S. B.A. 1967, University of Pennsylvania	N.Y.	Johnson, Terry L. B.A. 1967, New Mexico State University	Texas
Jacobs, Michael J. B.S. 1963, U.S. Coast Guard Academy	Md.	Johnston, John H. B.A. 1967, American University	Va.
Jacobs, Robert J. B.A. 1969, American University	N.J.	Johnstone, William T. B.A. 1969, American University	Md.
Jacoby, David B.A. 1969, Rutgers, the State University	D.C.	Jones, Charles R. B.A. 1967, Kent State University	Md.
Jani, Jerome J. B.A. 1963, Catholic University of America	Md.	Jones, Janice R. B.A. 1966, California State College at Hayward	D.C.
Jellish, Colin J. B.S. 1964, Northland College	Va.	Jones, Richard E. B.A. 1959, Maryville College	Va.
Jensen, Douglas V. B.A. 1966, Brigham Young University	Mich.	Jones, Stanley D. B.A. 1966, Wilkes College	Va.
Jeweler, Bernard P. B.A. 1967, University of Maryland	Md.	Josephson, Carl B.S. 1965, U.S. Coast Guard Academy	Va.
Johnson, James A. B.A. 1960, Occidental College	D.C.	Juarez, Lenin B.A. 1968, Texas Technological University	Va.
Johnson, James W., Jr. B.S. in E.E. 1963, Howard University	Va.	Jump, George F., Jr. B.A. 1967, University of Maryland	Md.

K

Kagan, Robert P. B.A. 1969, George Washington University	Pa.	Kalish, William B.A. 1967, University of Pittsburgh	N.J.
Kahane, Dennis S. B.A. 1969, Tulane University of Louisiana	Fla.	Kam, Allan J. B.A. 1969, Drew University	N.J.
Kahn, Frank E. B.A. 1968, Columbia University	N.Y.	Kane, John F. B.A. 1967, College of William and Mary	Va.
Kahn, William A. B.S. 1959, University of Pennsylvania	Md.	Kanengiser, Jay R. B.A. 1967, Columbia University	N.J.
Kalik, Mildred E. B.A. 1969, University of Wisconsin	N.Y.	Kanoff, Richard A. B.A. 1969, Lafayette College	Conn.

Kardis, Phillip J.	Va.	King, David M.	Ohio
B.S. 1965, University of Illinois		B.S. 1969, University of Wisconsin	D.C.
Karp, Irwin D.	N.Y.	Kingsley, David J.	D.C.
B.A. 1967, City College, New York		B.A. 1968, Monmouth College, Ill.	D.C.
Karrat, Anthony J.	N.Y.	Kirby, John E.	D.C.
B.A. 1967, University of Notre Dame		B.B.A. 1968, George Washington University	D.C.
Kassenoff, Melvyn M.	Md.	Kirtland, John C.	Md.
B.A. 1964, Columbia University		B.S. 1961, U.S. Naval Academy	
M.S. 1966, Massachusetts Institute of Technology		Kleeman, Nancy J.	N.Y.
Kattenburg, Philip C.	Va.	B.A. 1967, Wellesley College	N.Y.
B.A. 1968, University of North Carolina at Chapel Hill		Klein, Gary S.	N.Y.
Katz, Craig D.	N.J.	B.A. 1968, Queens College, N.Y.	
B.A. 1967, University of North Carolina at Chapel Hill		Klein, Justin P.	Va.
Katz, Kay M.	Ill.	B.A. 1969, University of Pennsylvania	Pa.
B.A. 1969, University of Wisconsin		Kleman, Richard D.	
Katz, Martin V.	N.Y.	B.A. 1962, Duquesne University	N.Y.
B.A. 1967, Queens College, N.Y.		Klinefelter, Michael R.	N.Y.
Katzberg, Robert	N.Y.	B.A. 1964, Dartmouth College	N.Y.
B.A. 1967, Brooklyn College		Klipper, Michael R.	N.Y.
Kaufman, David J.	N.Y.	B.A. 1969, Syracuse University	Wis.
B.A. 1968, City College, New York		Koch, Arthur D.	D.C.
Kaufman, Howard J.	N.Y.	B.A. 1969, Syracuse University	
B.S. 1966, Cornell University		Koehler, Dennis P.	N.Y.
Kaufman, Louis H.	Pa.	B.S. 1963, University of Wisconsin, Milwaukee	
B.A. 1969, Franklin and Marshall College		Koenig, Martha J.	N.Y.
Kawashima, James	Va.	B.A. 1969, University of Michigan	
B.A. 1964, Lewis and Clark College		Koff, Gail J.	Mass.
Kaye, Martin S.	N.Y.	B.A. 1967, University of California, Berkeley	N.J.
B.A. 1969, University of Wisconsin		Konowitz, Steven S.	N.J.
Kaye, Robert N.	N.Y.	B.A. 1969, Boston University	N.J.
B.S. 1967, New York University		Kopecki, Alan E.	Ill.
Keary, Thomas J.	Maine	B.M.E. 1966, Villanova University	
B.S. 1969, Boston College		Koppel, James G.	Md.
Keiper, Edward H.	Kans.	B.A. 1966, University of Wisconsin	
B.A. 1969, Dickinson College		Koransky, Ralph J.	Conn.
Keith, Sharon S.	Ohio	B.S. 1968, Purdue University	
B.A. 1966, University of Akron		Kornbau, Anne M.	D.C.
Kelley, Robert P., Jr.	Fla.	B.S. 1966, Drexel Institute of Technology	
B.A. 1969, Tulane University of Louisiana		Kosloff, Alan M.	Va.
Kelly, Sheila M.	Wash.	B.A. 1968, University of Connecticut	
B.A. 1964, Catholic University of America		Kovey, Myra G.	Md.
Kelly, William P.	D.C.	B.A. 1965, Barnard College	N.Y.
B.A. 1966, University of the South		Kowalski, Raymond A.	N.Y.
Kendall, Peter W.	Pa.	B.A. 1967, St. Bonaventure University	
B.A. 1967, Temple University		Kraisel, Leonard W.	N.Y.
Kennedy, Cain J.	Ala.	B.S. 1961, Purdue University	N.Y.
B.A. 1966, California State College at Los Angeles		Kramer, Michael A.	Va.
Kennedy, Jill M.	Ariz.	B.A. 1967, Syracuse University	
B.A. 1969, American University		Kramer, Robert A.	D.C.
Kenyon, David B.	Conn.	B.A. 1968, Queens College, N.Y.	
B.A. 1965, Yale University		Kramer, Theodore D.	N.Y.
Kernan, James E.	Va.	B.B.A. 1967, University of Michigan	
B.A. 1968, Boston College		Kress, Alan H.	Md.
Kerns, Christopher M.	Va.	B.A. 1968, New York University	
B.S. in B.A. 1969, University of Dayton		Krieger, Amy S.	Md.
Kidwell, Harold K.	Va.	B.A. 1969, Syracuse University	
B.A. 1968, George Washington University		Krosin, Kenneth E.	Md.
Kile, Bradford E.	D.C.	B.S.E. 1966, Princeton University	N.J.
B.M.E. 1966, Ohio State University		M.S.E. 1967, University of Michigan	
Killian, Paul W.	Ind.	Krueger, Frank K., Jr.	Nebr.
B.S. in B.A. 1969, Washington University		B.A. 1967, Johns Hopkins University	Conn.
Kimble, James L.	Md.	Krugman, James D.	
B.S. 1968, Denison University		B.A. 1969, Colgate University	
		Kruse, James R.	
		B.A. 1967, Nebraska Wesleyan University	
		Kweskin, Edward M.	
		B.A. 1968, University of Pennsylvania	
L			
Laden, Gary M.	N.J.	Lager, Scott L.	
B.A. 1969, Adelphi University		B.A. 1967, University of Maryland	

Lamb, Eric M. B.S. 1968, University of Louisville	Ky.	Lewis, Stephen I. B.A. 1969, Tulane University of Louisiana	N.J.
Lamb, Raymond P. B.A. 1967, Dartmouth College	Va.	Lewis, Warren L. B.S. 1967, University of Maryland	Va.
Lamotte, Leo L. B.S. in B.A. 1962, University of North Dakota	Va.	Ley, John R. B.S. in E.E. 1969, Kansas State University of Agriculture and Applied Science	Kans.
Land, Douglas S. B.A. 1967, Boston University	N.Y.	Lieber, Michael S. B.A. 1967, Michigan State University	N.Y.
Langley, Peter D. B.A. 1968, University of Wisconsin	Wis.	Lieberman, Carolyn J. B.A. 1968, University of Minnesota	Va.
Larsen, James M. B.A. 1969, Rutgers, the State University	D.C.	Lieberman, Erik R. B.A. 1967, University of Pittsburgh	Pa.
Lawrence, Stanton T. B.S. 1967, Colorado State University	Va.	Lindburg, John A. B.A. 1966, Yale University	Ill.
Lawson, Edward F. B.A. 1968, Howard University	D.C.	Linder, Norbert S. B.A. 1969, George Washington University	Va.
Lawson, Nancy A. B.A. 1968, Indiana University	Ark.	Link, John E. B.S. 1968, University of New Hampshire	Calif.
Leal, Hector J. B.A. 1960, University of Texas at Austin	Va.	Link, Thomas R. B.A. 1968, Georgetown University	N.Y.
Leath, William J., Jr. B.A. 1967, University of North Carolina at Chapel Hill	D.C.	Little, Michael J. B.A. 1964, University of Notre Dame	Colo.
Lee, Duane R. B.A. 1969, Dartmouth College	D.C.	Litvin, David A. B.S. in M.E. 1969, Drexel Institute of Technology	Md.
Lefenfeld, Mark S. B.A. 1967, Franklin and Marshall College	N.Y.	Loeb, Milford, II B.A. 1968, U.S. International University	Va.
Lelong, Marion P. B.S. 1949, Virginia Polytechnic Institute	Va.	Loftus, William R. B.S. 1967, Utah State University of Agriculture and Applied Science	Md.
Lent, Peter D. B.A. 1968, George Washington University	Md.	Loud, George A. B.S. 1965, Christian Brothers College	Tenn.
Leonardo, John S. B.A. 1969, University of Notre Dame	Md.	Louiselle, Bruce M. B.A. 1965, George Washington University	Va.
Leone, James R. B.S. 1965, University of Virginia	Va.	Low, Susan A. B.A. 1968, Skidmore College	Md.
Leong, Ronald Y. B.A. 1969, Coe College	Hawaii	Lubman, Bruce M. B.A. 1969, University of North Carolina at Chapel Hill	N.J.
Lerman, Steven A. B.S. 1969, University of Pennsylvania	Mass.	Luchs, Lorin D. B.B.A. 1968, George Washington University	D.C.
Letson, Laurence R. B.S. in M.E. 1963, University of Nebraska	Va.	Luckett, Jackson R. B.Gen.Ed. 1964, University of Nebraska at Omaha	D.C.
Leventhal, Robert C. B.A. 1965, Lafayette College	N.J.	Lunsford, John K. B.A. 1966, Olivet Nazarene College	Md.
Levine, Robert E. B.A. 1967, George Washington University	Md.	Lupton, Johnnie E. B.S. 1962, University of Maryland	Md.
Levine, Robert M. B.A. 1969, Pennsylvania State University	Pa.	Lux, Laurence G. B.S. 1959, University of Wisconsin	Va.
Levy, Charles S. B.A. 1967, Boston University	Ill.	Lyon, Charles B. B.S. 1967, University of Oklahoma	D.C.
Levy, Joan L. B.A. 1969, George Washington University	N.Y.	Lyons, John F. B.A. 1968, Williams College	Mass.
Lewin, Stuart F. B.A. 1966, Indiana University	D.C.	Lysaght, James F. B.A. 1969, Fairfield University	N.Y.
Lewis, Elise A. B.A. 1967, University of Pennsylvania	D.C.		
Lewis, Sandra J. B.A. 1968, University of Maryland	Md.		

M

Mack, Peter G. B.S. 1968, Marquette University	Conn.	Mangels, Robert E. B.A. 1965, Pennsylvania State University	Md.
Mackie, Alexander W. B.A. 1967, Claremont Men's College	Oreg.	Mann, John B. B.A. 1967, Duke University	Va.
MacRae, Marion M. B.A. 1967, Sweet Briar College	Va.	Marc, Kenneth H. B.S. in B.A. 1969, American University	Va.
Maddex, Robert L., Jr. B.A. 1965, George Washington University	D.C.	Marcus, Richard I. B.A. 1967, University of Pennsylvania	Md.
Magnone, Joseph R. B.S. in Ch.E. 1965, University of Pittsburgh	Va.	Margeton, Stephen G. B.A. 1967, Mount St. Mary's College, Md.	N.J.

Markison, Kenneth A.	Md.	McKenzie, Gregory A.	Okla.
B.A. 1969, George Washington University		B.A. 1969, University of Oklahoma	
Markman, David J.	N.Y.	McLaughlin, John J., Jr.	Md.
B.A. 1968, George Washington University		B.S. 1964, U.S. Merchant Marine Academy	Colo.
Marrs, Thomas P.	Ill.	McMahon, Margaret M.	Va.
B.A. 1967, Blackburn College		B.A. 1967, University of Denver	
Marrus, Alan D.	N.Y.	McNamara, Harlow J.	Mich.
B.A. 1967, Brooklyn College		B.S. 1967, Brigham Young University	
Marsh, Michael H.	Mass.	McNeil, John T.	Md.
B.A. 1969, Boston University		B.A. 1969, University of Michigan	
Marsh, Michael R.	Hawaii	McNett, John C.	Va.
B.A. 1969, Blackburn College		B.S. 1967, Purdue University	
Marshall, Susan A.	D.C.	McQuade, William M.	N.J.
B.A. 1967, Vassar College		B.S. 1965, Ohio State University	
Martel, Charles N.	N.J.	Mechanic, Gene B.	Va.
B.A. 1969, Albion College		B.A. 1969, University of Rochester	
Martell, Lynn A.	N.Y.	Mechling, James E.	Okla.
B.A. 1969, City College, New York		B.S. 1940, Haverford College	
Martin, Harry C.	D.C.	Meister, Stuart G.	Mass.
B.A. 1967, University of Virginia		B.A. 1965, Westminster College, Mo.	
Martin, John C.	Ohio	Melaugh, Anne Marie C.	Md.
B.S. in E.E. 1968, University of Cincinnati		B.A. 1969, Newton College of the Sacred Heart	
Martin, Roland E., Jr.	Va.	Meltzer, Harvey R.	Va.
B.S. 1962, University of Maryland		B.S. 1963, University of Florida	
Marutollo, Frank	N.Y.	Meltzer, Thomas S.	Utah
B.A. 1967, City College, New York		B.S. 1968, New York University	
Massey, Donald F.	Va.	Mendenhall, Gregory B.	D.C.
B.A. 1967, San Diego State College		B.A. 1968, Brigham Young University	
Matthews, Cornel	Ohio	Menell, Howard A.	Md.
B.A. 1969, Oberlin College		B.A. 1967, Syracuse University	
Matthews, Cynthia C.	D.C.	Menick, Jeffrey M.	N.Y.
B.A. 1965, Howard University		B.A. 1968, University of Maryland	
May, Jerry C.	Md.	Mentlik, William L.	Ky.
B.A. 1968, University of California, Riverside		B.S. in Ch.E. 1969, University of Pennsylvania	
May, Roger L.	Va.	Meredith, Ronald E.	N.Y.
B.A. 1967, University of Rochester		B.A. 1967, Georgetown University	
Mazor, Leonard M.	N.Y.	Mermelstein, Stephen E.	Md.
B.A. 1967, Dartmouth College		B.A. 1968, George Washington University	
Mazur, John A.	Conn.	Metro, Alan H.	N.Y.
B.S. 1969, Lehigh University		B.A. 1968, University of Maryland	
Mazzaferrri, Katherine A.	Pa.	Meyers, Herbert D.	D.C.
B.A. 1969, New York University		B.A. 1968, University of Miami	
McAllister, Peggy L.	S.C.	Meyers, Ishmael A.	N.Y.
B.A. 1969, Howard University		B.S. 1962, Morgan State College	
McArthur, Charles D.	D.C.	M.B.A. 1964, American University	
B.A. 1969, University of Maryland		Meyers, Peter H.	Md.
McCarthy, John F., III	Va.	B.A. 1968, Marietta College	
B.A. 1967, Cornell University		Michael, Robert R.	Va.
McClure, Stephen J.	Md.	B.A. 1968, George Washington University	
B.A. 1966, M.A. 1967, Fordham University		Michaels, Richard	N.Y.
McCullum, Douglass J.	D.C.	B.A. 1964, M.A. 1967, American University	
B.A. 1967, Duke University		Michaud, Frederick G.	Hong Kong
McConnell, Nicholas S.	Va.	B.S. 1968, Lafayette College	
B.A. 1968, Bowdoin College		B.A. 1968, Hobart College	Ohio
McCormack, Brian M.	Va.	Midgley, James W.	Pa.
B.A. 1968, University of Virginia		B.A. 1968, Case Western Reserve University	
McCormack, Kevin E.	Va.	Mika, Frank A.	Pa.
B.B.A. 1965, George Washington University		B.A. 1963, Washington and Jefferson College	
McCormick, Edward P.	Ohio	Miles, Virginia G.	N.Y.
B.A. 1969, Central State University		B.S. 1967, Ohio State University	
McCrary, Frances P.	Pa.	Miller, Adelaide M.	N.Y.
B.A. 1969, Rollins College		B.A. 1964, George Washington University	
McGuire, Stephen P.	N.Y.	Miller, Alan H.	Va.
B.A. 1969, Villanova University		B.A. 1968, University of Pennsylvania	
McGuire, Susan E.	Va.	Miller, Conway D.	Del.
B.A. 1969, George Washington University		B.A. 1963, Davis and Elkins College	
McHale, Bruce B.	Wyo.	Miller, Craig	N.J.
B.A. 1967, University of Wyoming		B.A. 1967, Duke University	
McInerney, William K.	Va.	Miller, Frederick H.	
B.A. 1969, Denison University		B.A. 1969, Washington and Jefferson College	
McIntosh, Ernest W., Jr.	D.C.		
B.A. 1967, Temple University			

Miller, Jan W. B.S. 1968, Georgetown University	Va.	Moore, Roger H. B.A. 1969, University of Washington	Idaho
Miller, Joel B. B.B.A. 1967, Adelphi University	N.Y.	Morgan, Gregory O. B.A. 1967, George Washington University	Va.
Miller, John H. B.S. 1960, University of Missouri	Va.	Morgan, Paul L. B.S. 1962, Frostburg State College	Va.
Miller, John R. B.A. 1969, University of Cincinnati	Ohio	Morris, Kenneth D. B.A. 1968, Ohio Wesleyan University	Pa.
Miller, Lawrence M. B.A. 1968, Dickinson College	Pa.	Morris, Margie B. B.A. 1969, Baylor University	Texas
Miller, Paul R. B.S. 1960, Kent State University	Va.	Morrison, Alexia B.A. 1969, Rutgers, the State University	N.J.
Miller, Ronald M. B.A. 1968, Ohio State University	Md.	Morrison, Hugh E. B.S. in Ae. 1962, St. Louis University	Ill.
Miller, Stanley M. B.S. in M.E. 1966, University of Rhode Island	Fla.	Morrison, Steven K. B.A. 1958, University of Pennsylvania	Md.
M.S. 1968, University of Miami		Moscato, Anthony C. B.A. 1967, Columbia University	N.Y.
Milligan, Cynthia H. B.A. 1967, University of Kansas	D.C.	Moser, William R. B.S. 1967, University of Virginia	Va.
Mintz, Herbert H. B.Ch.E. 1966, Cooper Union	N.Y.	Moskowitz, Simor L. B.A. 1969, George Washington University	D.C.
Mintz, Richard L. B.A. 1968, University of Michigan	Conn.	Moss, Ambler H., Jr. B.A. 1960, Yale University	Md.
Mitchell, Douglas B. B.S. 1968, University of Nebraska	Va.	Mossman, Boyd P. B.S. 1965, U.S. Air Force Academy	Md.
Mitchell, Robert B., Jr. B.S. 1957, Lehigh University	D.C.	Mossman, Frances I. B.A. 1957, University of Hawaii	D.C.
Moffett, James D., III B.B.A. 1969, University of Oklahoma	Okla.	Muller, John F. B.A. 1969, University of Notre Dame	Ind.
Moffitt, Denis L. B.A. 1969, Union College, N.Y.	Mass.	Mullins, Dennis P. B.A. 1959, Columbia University	Va.
Mones, Bruce E. B.A. 1967, Franklin and Marshall College	Md.	Mullins, Hual C. B.A. 1969, Wellesley College	Va.
Montgomery, Frederick L. B.A. 1962, University of Arizona	Md.	Mulloy, Patrick A. B.A. 1962, King's College, Pa.	Pa.
M.A. in Govt. 1965, George Washington University		Mun, Ronald B. B.A. 1969, University of California, Berkeley	Hawaii
Monts, Paul W. B.A. 1966, Oberlin College	Ind.	Munter, Harold G. B.A. 1967, Dickinson College	N.J.
Moore, Paul A. B.A. 1967, Franklin and Marshall College	N.Y.	Murphey, Michael R. B.A. 1969, Miami University	Va.
Moore, Philip L. B.S. 1967, Bucknell University	Maine	Murtagh, Brian M. B.S. 1968, Georgetown University	N.Y.
Moore, Robin A. B.A. 1968, University of North Carolina at Greensboro	D.C.	Myshin, Amil N. B.A. 1968, Washington and Jefferson College	Md.
N			
Nardi, Henry J. B.A. 1965, Lehigh University	Pa.	Nielsen, Kris R. B.S. E. 1967, Princeton University	Md.
Nash, Thomas K. B.A. 1967, Bucknell University	D.C.	Niewyk, Anthony B.S. 1963, Calvin College	N.Y.
Nathan, Harvey J. B.A. 1967, Brooklyn College	N.Y.	Niman, Kenneth P. B.A. 1969, Johns Hopkins University	Mass.
Naveen, Ronald S. B.A. 1967, University of Pennsylvania	Pa.	Noble, Ann M. B.A. 1969, Western College for Women	Ind.
Neary, John M. B.S. 1966, C.W. Post College	Va.	Noble, Lawrence C. B.A. 1969, University of Pennsylvania	N.J.
Nemkov, Peter M. B.A. 1967, University of Michigan	Ill.	Nolan, James G. B.A. 1965, Georgetown University	Md.
Nesland, James E. B.A. 1966, University of Denver	S.D.	Nord, Nancy A. B.A. 1968, University of Nebraska	S.D.
Nevins, Richard P. B.A. 1967, College of the Holy Cross	Conn.	Norris, William H. B.S. 1965, U.S. Coast Guard Academy	Mass.
Newlands, Bruce W. B.A. 1969, St. Anselm's College	Mass.	Novenstein, Evan M. B.A. 1968, Columbia University	Va.
Newton, Margaret K. B.A. 1968, Smith College	Pa.	Novick, Harold L. B.A. 1964, Miami University	Md.
Nickel, William F., III B.A. 1968, Johns Hopkins University	N.Y.		

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B.A. 1969, University of Southern California
Nudelman, Barry Pa.
B.A. 1968, University of Pittsburgh

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B.S. 1964, M.S. in E.E. 1966, Massachusetts
Institute of Technology
O'Connor, David F. D.C.
B.A. 1968, Vanderbilt University
Odom, Harry E. Md.
B.A. 1969, Washington and Jefferson College
O'Keefe, Dennis M. Ill.
B.A. 1969, University of Illinois
Oliver, Edward F. Va.
B.S. 1942, California Maritime Academy
Oliver, William H. Va.
B.A. 1969, Williams College
Olson, James K. Md.
B.S. 1964, Brigham Young University
O'Rourke, Charles L. Va.
B.S. 1959, M.B.A. 1961, Stanford University
- Osborne, Harry V., II Va.
B.A. 1969, Trinity College, Conn.
Oshins, Joseph H. Mo.
B.A. 1968, University of Missouri
Osnowitz, Samuel Ohio
B.B.A. 1968, University of Toledo
Ostby, Bryn R. Va.
B.A. 1964, St. Olaf College
Oster, Warren Md.
B.A. 1968, University of Maryland
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B.S. 1968, Kansas State University of
Agriculture and Applied Science
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B.A. 1969, California State College at
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- Padgett, Charles P., Jr. Md.
B.S. 1968, Pennsylvania State University
Palan, Perry Mo.
B.S. in E.E. 1965, Washington University
Palumbo, Elaine F. Md.
B.A. 1967, George Washington University
Panagakos, Alexis N.J.
B.S. 1969, Tufts University
Paperner, Leslie J. Mo.
B.S. 1969, University of Illinois
Park, Robert C., Jr. Md.
B.A. 1969, Hiram College
Parker, David S. N.J.
B.S. 1969, University of Maryland
Parker, Richard H., Jr. Texas
B.A. 1967, University of Houston
Parker, Whilden S. Va.
B.Gen.Std. 1960, Louisiana State University
Pasachoff, Jane M. N.Y.
B.A. 1965, Radcliffe College
Paskvan, Joseph M. N.Y.
B.A. 1967, Michigan State University
Paul, Robert E. Ohio
B.A. 1967, Case Western Reserve University
Paul, Robert J. Wis.
B.A. 1966, St. Francis Seminary
Pavlinic, Thomas A. Ohio
B.S. 1969, University of Maryland
Peck, Jeffrey A. Va.
B.A. 1967, Syracuse University
Pedersen, Amanda B. Pa.
B.A. 1966, Vassar College
Pell, William P. Del.
B.A. 1968, DePauw University
Penland, Raphael B. D.C.
B.A. 1951, University of British Columbia
Pennell, David H. Calif.
Ed.B. 1960, University of Alaska
Perez, Abelardo I. Texas
B.A. 1968, University of Houston
Perkins, Thomas G. Mass.
B.A. 1967, Tufts University
- Perlman, Kenneth W. N.Y.
B.A. 1969, Syracuse University
Perlmutter, Leonard T. N.Y.
B.A. 1968, American University
Permar, David H. Md.
B.A. 1969, University of Maryland
Persun, Lloyd R. Va.
B.A. 1968, Dickinson College
Peters, Mary E. D.C.
B.A. 1967, Rhode Island College
Petock, Michael F. Va.
B.S. 1968, Pennsylvania State University
Petraitis, Karel C. Md.
B.A. 1967, University of Maryland
Phillips, Bruce L. N.Y.
B.A. 1968, University of Rochester
Pierson, Douglas L. Va.
B.A. 1969, Lafayette College
Pillsbury, Lynde H. Minn.
B.A. 1965, Yale University
Pires, Alexander J. Mass.
B.S. in B.A. 1969, Boston University
Plessner, Ronald L. N.Y.
B.A. 1967, George Washington University
Plover, Suellen Calif.
B.S. 1963, Stanford University
Polk, Robert L. Va.
B.A. 1962, Berea College
Polmer, Henry M. D.C.
B.A. 1967, Washington University
Pope, Kent S. Pa.
B.A. 1968, Denison University
Portugal, Richard J. N.Y.
B.A. 1968, Syracuse University
Powell, Bret P. Vt.
B.A. 1969, University of Vermont
Powell, Stephen E. Md.
B.A. 1967, Franklin and Marshall College
Preminger, Daniel M. N.Y.
B.A. 1967, Hunter College
Price, Charlie Md.
B.A. 1969, Virginia Union University

Proffer, Lanny M.	Mo.	Przyblinski, Donald	Ind.
B.A. 1964, Southeast Missouri State College		B.A. 1959, Indiana University	
Proto, Neil T.	Conn.	Puckett, Thomas D.	Texas
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Rabinovitz, Bruce H.	Mo.	Rizzo, John A.	Mass.
B.A. 1967, George Washington University		B.A. 1969, Brown University	
Rackley, Claude L., Jr.	N.C.	Robb, David R.	Va.
B.S. 1965, North Carolina State University at Raleigh		B.A. 1969, Bowling Green State University	
Rae, James A.	Md.	Roberts, Helen W.	N.Y.
B.A. 1968, George Washington University		B.A. 1958, Cornell University	
Raley, Charles E.	Va.	Roberts, Joseph D.	Mo.
B.A. 1968, University of Virginia		B.A. 1968, University of Missouri	
Ramirez, Juan	Md.	Roberts, Robert L.	Pa.
B.S. 1962, Georgetown University		B.A. 1969, Ursinus College	
Raskin, Martin G.	Md.	Rochestie, Howard M.	N.J.
B.E. 1968, Queens College, N.Y.		B.S. 1969, University of Pennsylvania	
Raskin, Samuel R.	Md.	Roddy, John P.	D.C.
B.S. 1961, City College, New York		B.S. in F.S. 1967, Georgetown University	
Rasmussen, Bruce D.	Va.	Rose, Leo N.	N.Y.
B.S. 1969, Fresno State College		B.A. 1969, George Washington University	
Rawlings, Stuart L., III	Calif.	Roseman, Robert D.	Mass.
B.A. 1966, Stanford University		B.A. 1969, Boston University	
M.A. 1969, University of Pennsylvania		Rosen, Alan E.	N.Y.
Redbord, Glenn L.	D.C.	B.A. 1967, Colby College	
B.A. 1968, Drew University		Rosen, Gerald A.	N.Y.
Rees, James M.	Utah	B.A. 1951, Swarthmore College	
B.S. 1967, University of Utah		M.A. 1956, Tufts University	
Reid, Thomas R.	Mich.	Rosen, James A.	Pa.
B.A. 1966, Princeton University		B.A. 1967, University of Pittsburgh	
Reid, William M.	Md.	Rosen, Lucile L.	D.C.
B.A. 1961, Southern Methodist University		B.S. 1962, Carnegie-Mellon University	
Reiling, Robert C.	Md.	Rosen, Mark A.	N.Y.
B.A. 1969, Purdue University		B.A. 1967, University of Louisville	
Reiver, Robert E.	Md.	Rosenberg, Frederick W.	Md.
B.B.A. 1968, George Washington University		B.A. 1967, New York University	
Respass, William L.	Va.	Rosenberg, Leonard L.	Md.
B.S. 1961, Virginia Military Institute		B.A. 1967, Queens College, N.Y.	
Ressler, Peter L.	Conn.	Rosenbleet, Charles	Pa.
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Rettinger, Arthur I.	Wyo.	Ross, Leonard N.	Mass.
B.B.A. 1969, George Washington University		B.A. 1969, George Washington University	
Reynolds, George T.	N.J.	Ross, Robert M.	D.C.
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Reynolds, Nicholas S.	Va.	Rothenberg, Jeffrey	N.Y.
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Rice, Paul H.	Md.	Rothermel, Timothy S.	Mass.
B.A. 1968, University of Michigan		B.A. 1968, Davidson College	
Rich, Bradford W.	Va.	Rothman, Saul A.	Conn.
B.A. 1969, Denison University		B.A. 1967, Brown University	
Richardson, Robert L.	Texas	Rothstein, Joel H.	N.Y.
B.S. 1964, Texas A&M University		B.A. 1969, University of Wisconsin	
Richter, Paul S.	Conn.	Rottiers, Robert B.	Mich.
B.S. 1968, Massachusetts Institute of Technology		B.S. 1966, U.S. Air Force Academy	
Richter, Sheldon J.	Ohio	Ruben, Diane D.	Md.
B.L.E. 1967, Ohio State University		B.A. 1967, University of Chicago	
Rigg, John B., Jr.	Md.	Rubino, Louis J., Jr.	Md.
B.A. 1969, George Washington University		B.B.A. 1967, George Washington University	
Rio, S.R., Jr.	Va.	Rubinstein, Alan I.	Va.
B.A. 1967, University of Virginia		B.A. 1967, Long Island University	

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| B.A. 1968, New York University | | B.A. 1967, Nebraska Wesleyan University | |
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| B.A. 1968, Lehigh University | | B.S. in E.E. 1964, Newark College of Engineering | Fla. |
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| B.A. 1968, Georgetown University | | B.A. 1968, Trinity College, Conn. | Pa. |
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| B.S. 1968, Indiana University | | B.A. 1967, University of Pennsylvania | Va. |
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| B.A. 1968, University of Bridgeport | | B.S.E.(M.E.), B.S.E.(Math.) 1968, University of Michigan | Va. |
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| B.A. 1967, George Washington University | | B.A. 1965, Wellesley College | |
| Sandler, David N. | Md. | Schwartz, Edward | |
| B.A. 1967, University of California, Los Angeles | | B.S. 1942, DePaul University | |
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| Savitzky, Eli L. | N.Y. | B.S. 1968, Ohio State University | |
| B.A. 1969, Brooklyn College | | Schwarz, James N. | Va. |
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| Scadron, Samuel M. | N.Y. | M.B.A. 1965, George Washington University | |
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| B.S. 1967, University of Wisconsin | | Scully, Cornelius D. | Pa. |
| Schain, Howard E. | N.Y. | B.A. 1957, University of Virginia | |
| B.A. 1960, Yeshiva University | | Seaks, George H. | Md. |
| M.S. 1963, Yale University | | B.A. 1968, University of Virginia | |
| Schell, Ronald J. | Minn. | Sears, Gregory H. | Pa. |
| B.A. 1967, University of Minnesota | | B.A. 1969, University of Maryland | |
| Scherr, Stephen A. | D.C. | Sease, Stephen B. | N.Y. |
| B.A. 1963, St. Louis University | | B.A. 1968, Williams College | |
| Schiffelbein, Wayne L. | Va. | Secol, Kenneth F. | Pa. |
| B.Arch. 1963, M.S. in Arch. 1964, University of Michigan | | B.S. 1968, Boston University | |
| M.S. 1966, Columbia University | | Seiber, Sherry S. | N.Y. |
| Schiffres, Jay | N.Y. | B.A. 1966, Ohio University | |
| B.A. 1969, University of Cincinnati | | Selzer, Herbert M. | N.J. |
| Schifreen, Carolyn J. | Pa. | B.S. 1967, Brooklyn College | |
| B.A. 1969, New York University | | Selzer, Steven M. | N.Y. |
| Schlanger, Michael A. | N.Y. | B.A. 1969, George Washington University | |
| B.A. 1965, Columbia University | | Semler, Steven R. | Mich. |
| Schlee, David R. | R.I. | B.A. 1967, Hunter College | |
| B.A. 1969, University of Wisconsin | | Senkowski, Ray M. | Conn. |
| Schmelzer, Don E. | Va. | B.A. 1968, Yale University | |
| B.A. 1963, University of Redlands | | Sessions, William K. | Md. |
| Schneider, Alan J. | Md. | B.A. 1969, Middlebury College | |
| B.A. 1968, University of Maryland | | Severy, Steven R. | Pa. |
| Schneider, Eileen M. | N.J. | B.A. 1969, Denison University | |
| B.A. 1969, George Washington University | | Shachter, Alan S. | |
| Schneider, Howard B. | N.J. | B.A. 1968, University of Pennsylvania | |
| B.A. 1967, Montclair State College | | | |

Shapiro, Paul E. B.S. 1967, Rensselaer Polytechnic Institute	N.Y.	Slobod, Jack D. B.E.E. 1964, City College, New York	Va.
Shapiro, Ronald S. B.S. 1969, University of Maryland	Md.	Slotnick, Carl B. B.A. 1969, University of Massachusetts	Mass.
Sheckels, Thomas R. B.S. 1965, U.S. Military Academy	Md.	Smiley, Robert R., III B.S. 1956, U.S. Naval Academy	Philippines
Sheinbein, Sol B.E. 1966, City College, New York	N.Y.	Smith, Barry H. B.A. 1968, Indiana University	Va.
Sheppard, Susan A. B.A. 1968, University of Wisconsin	Md.	Smith, Donald G. B.A. 1953, Kansas State Teachers College	Va.
Sher, Richard J. B.S. in I.E. 1969, Purdue University	Md.	Smith, Eric L. B.S. 1964, University of California, Los Angeles	Ill.
Sherry, John P. B.S. 1968, University of Maine	Md.	Smith, Gary M. B.A. 1969, Johns Hopkins University	Va.
Shipley, Charles W. B.S. 1966, Oklahoma State University	Okla.	Smith, Gwynette R. B.A. 1966, Pennsylvania State University	Del.
Shirley, George W. B.S. 1941, Boston University	Mass.	Smith, Jack D., Jr. B.A. 1968, George Washington University	Va.
Shoneman, Charles H. B.A. 1969, Duke University	Pa.	Smith, John D. B.C.E. 1966, Georgia Institute of Technology	Ga.
Shorenstein, Ronnie B.A. 1969, Syracuse University	N.Y.	Smith, John G. B.S. 1966, Case Western Reserve University	Ky.
Shoun, Mary C. B.A. 1968, University of Maryland	Va.	Smith, John J., III B.S. 1963, M.D. 1967, University of Maryland	Md.
Shuffman, David K. B.A. 1969, Brandeis University	N.Y.	Smith, Peter T. B.S. 1968, Loyola University, Ill.	Ill.
Shulman, James H. B.A. 1968, George Washington University	Conn.	Smith, Sheldon L. B.A. 1968, Roosevelt University	Ill.
Shupack, Richard A. B.A. 1968, Bowling Green State University	N.J.	Snowdon, Charles D. B.A. 1969, Trinity College, Conn.	Md.
Sideman, Robert A. B.A. 1967, University of Michigan	Ill.	Sofoeleous, Michael B.S. 1965, Rensselaer Polytechnic Institute	N.Y.
Silberberg, Charles T. B.S. in M.E. 1969, Drexel Institute of Technology	Pa.	Solit, James N. B.A. 1967, George Washington University	N.Y.
Silberhart, Allan S. B.S. 1967, University of Pennsylvania	N.Y.	Solomon, Robert A. B.A. 1969, Rutgers, the State University	N.J.
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Siler, John P. B.A. 1966, Yale University	Mich.	Sommers, Steven E. B.A. 1969, Gettysburg College	N.J.
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Silverberg, Robert P. B.B.A. 1967, Tulane University of Louisiana	Va.	Spaeder, Roger C. B.S. in Ed. 1965, Bowling Green State University	Ohio
Silverman, Donald N. B.S. 1969, Boston University	N.Y.	Speaker, John H. B.A. 1969, Brown University	Md.
Silverman, Robert M. B.A. 1968, University of Wisconsin	N.Y.	Spector, Stephen H. B.A. 1966, C.W. Post College	Va.
Simkanich, John J. B.S. 1964, Drexel Institute of Technology	Pa.	Spencer, William G. B.A. 1969, Tufts University	Mass.
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Skelly, Kenneth B. B.A. 1968, Xavier University, Ohio	Md.	Spensley, James W. B.S. in I.E. 1969, Iowa State University of Science and Technology	D.C.
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Slade, Grant E. B.A. 1966, New Mexico Highlands University	Va.	Spivack, Stephen R. B.A. 1968, Temple University	Pa.
Slaughter, Harrison T., Jr. B.A. 1969, George Washington University	D.C.	Sprague, Dale M. B.A. 1967, University of Kansas	Kans.
Slippen, Richard I. B.A. 1968, Alfred University	N.Y.	Stribnick, Howard L. B.A. 1968, Bucknell University	N.Y.
Sloan, Marcus H. B.A. 1967, University of Nevada	Md.	Stake, Charles D. B.A. 1968, George Washington University	D.C.
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Stanley, Nancy E.	D.C.	Stover, Jon R.	
B.A. 1964, Knox College		B.A. 1967, Wesleyan University	N.Y.
Stasny, James N.	Ind.	Strassler, Marc A.	N.Y.
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Steenland, Peter R., Jr.	N.J.	Strausberg, Gary I.	D.C.
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Stein, Robert J.	D.C.	Streff, Rodney J.	D.C.
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Steinberg, Mark A.	Md.	Strong, Jay V., Jr.	
B.A. 1969, Boston University		B.A. 1968, Oglethorpe College	Kans.
Stenstrom, Robert B.	Mo.	Suffling, David N.	Hawaii
B.S. in M.E. 1967, University of Washington		B.S. 1968, University of Tennessee	N.Y.
Stenzel, Dennis E.	Va.	Sullivan, Brian E.	
B.S. 1967, Brigham Young University		B.A. 1969, Wichita State University	D.C.
Stern, Harry M.	D.C.	Sumida, Clyde E.	D.C.
B.S. 1968, Pennsylvania State University		B.A. 1968, University of Hawaii	D.C.
Stevens, Garrett B.	Pa.	Sussman, Edward C.	D.C.
B.A. 1969, Denison University		B.S. 1969, Cornell University	D.C.
Stewart, Joseph V.	N.J.	Sussman, Robert J.	D.C.
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Stewart, Ronald N.	Md.	Sutton, John R.	
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Stillman, Elinor H.	Md.	Sutton, Michael O.	Ill.
B.A. 1960, University of Kansas		B.S. 1969, University of Alabama	
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B.A. 1968, University of Maryland		Swersky, David M.	Calif.
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		B.A. 1967, Brigham Young University	

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Tamis, Donald H.	N.Y.	Todd, Glenn T.	Va.
B.A. 1967, Tufts University		B.S. 1966, College of William and Mary	Va.
Tanis, Donald J.	Va.	Toth, Victor J.	Va.
B.S. 1960, Western Michigan University		B.S. in M.E. 1966, Ohio University	D.C.
Tarnowski, George	N.Y.	Treacy, Vincent E.	
B.A. 1967, Franklin and Marshall College		B.A. 1964, Boston College	Md.
Tavel, James W.	Md.	Trigo, Fred N.	
B.A. 1967, George Washington University		B.A. 1969, Pan American College	Md.
Taxin, David R.	N.Y.	Tripp, Alfred M.	Md.
B.A. 1969, George Washington University		B.S. 1965, Virginia Polytechnic Institute	Ohio
Teague, Randal C.	Fla.	Tripp, Elizabeth M.	
B.A. 1967, American University		B.A. 1964, Trinity College, D.C.	W.Va.
Teckler, Martin D.	N.Y.	Tucker, Louise M.	
B.A. 1968, Boston University		B.A. 1968, University of Colorado	Fla.
Tencer, Daniel	D.C.	Tucker, Patrick A.	
B.A. 1967, City College, New York		B.S. 1969, Virginia Polytechnic Institute	N.Y.
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B.A. 1967, Queens College, N.Y.		B.A. 1968, Georgetown University	Va.
Tettelbaum, Richard M.	Md.	Turchi, Eugene A.	
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Thomas, Joseph F.	Ohio	Turner, John A.	
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Thornton, William M.	D.C.	Turner, John M.	Mass.
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B.A. 1962, University of Michigan		B.S. 1967, American University	
Thurm, Gilbert	N.Y.	Tyler, Robert M., Jr.	
B.A. 1969, Brooklyn College		B.A. 1969, Dartmouth College	
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D.C.
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B.A. 1963, Trinity University
J.D. 1969, University of Texas at Austin
Texas
- Love, Laurence J.
B.S. 1964, University of Wisconsin
J.D. 1967, Marquette University
Va.
- Lynch, Robert S.
B.A. 1961, LL.B. 1964, University of Arizona
N.Y.
- Lynn, Theodore S.
B.A. 1958, Columbia University
LL.B. 1961, Harvard University
LL.M. 1962, New York University
Md.
- Lyons, Joseph S.
B.S. 1958, University of Maryland
LL.B. 1967, Eastern College

M

- Macrory, Patrick F. J.
B.A., M.A. 1968, Oxford University, England
England
- Madani, Mohammed O.
Licence en Droit 1961, Cairo University, Egypt
D.C.
- Maher, Thomas P.
B.A. 1963, LL.B. 1966, Fordham University
Va.
- Mainelli, Albert J., Jr.
B.A. 1963, Providence College
B.C.L. 1966, College of William and Mary
Va.
- Malmon, Stuart E.
B.S. 1964, J.D. 1967, University of Wisconsin
D.C.
- Mandel, Martin L.
B.A. 1965, J.D. 1968, University of Southern California
Calif.
- Manfreda, Richard H.
B.S. in B.A. 1963, Georgetown University
J.D. 1966, American University
D.C.
- Mangrum, Robert A.
B.S. 1964, LL.B. 1967, University of Tennessee
Ala.
- Marshall, Roger D.
B.S. 1966, Southern State College, Ark.
J.D. 1969, South Texas College of Law
Texas
- Martin, Boe W.
B.A. 1962, Texas A&M University
LL.B. 1964, University of Texas at Austin
Va.
- Martin, David L.
B.A. 1964, Washington State University
J.D. 1967, University of Washington
Wash.

- Matthews, Marvin F. D.C. B.A. 1957, University of Rochester
J.D. 1960, American University
LL.M. 1961, George Washington University
- Maxon, William N. D.C. B.A. 1942, Columbia University
LL.B. 1950, University of Virginia
- McCaffrey, Hugh C. Md. J.D. 1939, Cleveland-Marshall Law School
- McGonagle, John J. D.C. B.A. 1966, Yale University
J.D. 1969, University of Michigan
- Mee, John F. D.C. B.A. 1965, College of the Holy Cross
LL.B. 1968, Suffolk University
- Mehta, Pinakin A. India LL.B. 1967, Gujarat University, India
- Merson, Edgar G. Va. B.A. 1958, J.D. 1961, Northwestern University
- Michael, George L., III D.C. B.A. 1961, Harvard University
LL.B. 1964, University of Minnesota
- Miller, Joel D.C. B.S. 1964, LL.B. 1967, University of Wisconsin
- Miller, John M. W.Va. B.A. 1959, LL.B. 1962, West Virginia University
- Mofsky, James S. Fla. B.A. 1956, Wesleyan University
LL.B. 1959, LL.M. 1966, Cornell University
- Montagna, Aldo B. Chile LL.B. 1949, Catholic University, Valparaiso, Chile
- Morritt, James C. Va. B.A. 1963, J.D. 1966, University of Idaho
- Morris, Jerome B. Mo. B.A. 1965, College of the Holy Cross
J.D. 1968, Washington University
- Morse, Anita L. Ind. B.S. 1962, Purdue University
J.D. 1968, Indiana University
- Moss, Frederick E. Md. B.A. 1961, Rice University
LL.B. 1964, University of Mississippi
- Mullins, Donald H. Va. B.S. 1965, Iowa State University of Science and Technology
J.D. 1967, University of Tennessee
- Murphy, David R. Va. B.Ch.E. 1957, Rensselaer Polytechnic Institute
LL.B. 1966, George Washington University
- Murray, Brenda P. Mass. B.A. 1960, D'Youville College
LL.B. 1963, Boston University
- Murray, Michael P. Va. B.A. 1953, Milton College
J.D. 1958, Marquette University
LL.M. 1960, John Marshall Law School
- Murrell, Dan S. Va. B.A. 1956, J.D. 1968, University of Mississippi

N

- Nance, Dean A. Ill. B.S. 1965, J.D. 1968, University of Illinois
- Naquin, Ronald L. La. B.A. 1963, LL.B. 1966, Tulane University of Louisiana
- Nauheim, Stephen A. Va. B.S. 1964, University of North Carolina at Chapel Hill
J.D. 1967, Georgetown University
- Neill, Benjamin J. Va. B.A. 1965, Kansas State University of Agriculture and Applied Science
J.D. 1963, Washburn University of Topeka
- Nelson, Paul G. D.C. B.A. 1966, Colgate University
J.D. 1969, George Washington University

O

- Ochs, Laurence J. Md. B.A. 1966, State University of New York at Buffalo
J.D. 1969, Howard University
- Oddi, Archie S. Pa. B.S. 1958, Carnegie-Mellon University
LL.B. 1963, University of Pittsburgh
- Oshins, Richard A. Va. B.S. 1963, American University
J.D. 1966, St. John's University, N.Y.
M.B.A. 1968, University of California, Berkeley
- Ostroff, Nathan G. D.C. B.S. 1962, University of Pennsylvania
LL.B. 1966, University of Texas at Austin
- Oxberry, Steven W. D.C. B.A. 1966, St. Olaf College
J.D. 1969, University of Miami

P

- Pachter, John S. Miss. B.A. 1963, Tulane University of Louisiana
LL.B. 1966, George Washington University
- Pai, Saraswati S. India LL.B. 1963, Government Law College, India
- Paroutsas, Athanasios D. D.C. LL.B. 1960, University of Athens, Greece
M.C.L. 1968, Duke University
- Patton, Thomas E. D.C. B.A. 1962, LL.B. 1965, Catholic University of America
- Pehrson, Gordon C. Va. B.A. 1964, College of William and Mary
J.D. 1967, University of Michigan
- Petersen, Eileen R. Virgin Islands B.S. 1958, M.A. 1959, Hampton Institute
J.D. 1966, Howard University
- Phillips, James H. Va. B.S. 1965, Ohio State University
J.D. 1968, George Washington University

Pineo, Paul, Jr. B.A. 1963, Colby College J.D. 1967, Georgetown University	Va.	Powers, James L. B.A. 1966, Yale University J.D. 1969, University of Florida	D.C.
Pipestem, Francis B. B.A. 1965, Northwestern Oklahoma State University J.D. 1968, University of Oklahoma	Okla.	Powers, Kathryn L. B.A. 1967, Vassar College J.D. 1969, University of Florida	D.C.
Pitts, Mildred E. B.A. 1953, Syracuse University LL.B. 1966, George Washington University	D.C.	Pritchett, Glenn D. J.D. 1968, Florida Agricultural and Mechanical University	D.C.
		Putzi, Patrick B.S. 1956, Marquette University LL.B. 1960, University of Wisconsin	Md.

Q

Quesenberry, William O. B.S. 1943, Virginia Polytechnic Institute J.D. 1949, George Washington University	Md.
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R

Raiken, Allen L. B.A. 1964, St. Lawrence University LL.B. 1967, St. John's University, N.Y.	Va.	Rose, James E., Jr. B.S. 1964, J.D. 1967, University of Illinois	Ill.
Ranney, John C. B.A. 1952, College of the Holy Cross LL.B. 1957, Georgetown University	Va.	Rosen, Harold I. B.B.A. 1964, J.D. 1967, George Washington University	Pa.
Reale, Ulrico LL.B. 1963, John Marshall Law School LL.M. 1966, George Washington University	Italy	Rosen, Mark L. B.A. 1963, University of Vermont LL.B. 1966, George Washington University	Va.
Ream, David W. B.A. 1959, LL.B. 1962, University of California, Berkeley	Calif.	Rosenberg, Mark B.A. 1963, C.W. Post College LL.B. 1966, Brooklyn Law School	Va.
Reed, Michael W. B.A. 1963, Whitman College LL.B. 1966, University of Washington	D.C.	Rosenberg, Peter D. B.Ch.E. 1963, New York University J.D. 1968, New York Law School	N.Y.
Remeikis, Albert A. B.S. 1964, St. John Fisher College, Inc. J.D. 1967, Georgetown University	Va.	Rosenbluth, Emery H., Jr. B.S. 1963, Lehigh University LL.B. 1966, University of Pennsylvania	Md.
Reyes, Vincente L. B.Com.S. 1960, Collegio de San Juan de Letran, Philippines	Philippines	Rosengarden, Eugene A. B.S. 1962, LL.B. 1965, University of Maryland	Md.
Ripple, Kenneth F. LL.B. 1964, San Beda College, Philippines	Philippines	Rothman, Samuel B. B.A. 1961, University of Pennsylvania LL.B. 1964, University of Miami	Va.
Rippl, Kenneth F. B.A. 1965, Fordham University LL.B. 1968, University of Virginia	Md.	Rowley, Robert D., Jr. B.A. 1962, LL.B. 1965, University of Pittsburgh	Pa.
Robins, Philip L. B.B.A. 1959, J.D. 1961, University of Miami	Va.	Rumphorst, Werner Rechtsreferendar 1968, Bayer Staatsministerium der Justiz, Germany	Germany
Rogers, Leslie L., III B.S. 1959, University of South Carolina J.D. 1967, Georgetown University	Va.		

S

Sabek, Mohamed F. License en Froit et Economie 1964, Cairo University, Egypt	United Arab Republic	Schiesser, Charles W. B.A. 1955, Concordia College, Moorhead, Minn.	D.C.
Sacks, Michael W. B.S. 1966, J.D. 1969, Temple University	Md.	LL.B. 1958, University of Minnesota LL.M. 1963, Georgetown University	Va.
Santner, Thomas R. B.A. 1962, J.D. 1964, University of Iowa	Va.	Schlegel, Howard J. B.A. 1963, Mount Union College LL.B. 1966, Duke University	Pa.
Sarasky, Arnold L. B.A. 1958, University of Pittsburgh LL.B. 1965, Eastern College	Md.	Schlusser, Robert E. B.A. 1964, Dickinson College J.D. 1967, Dickinson School of Law	Va.
Sastri, Durvasula S. LL.B. 1957, Anohra University, India	India	Schor, Laurence B. B.B.A. 1963, Southern Methodist University LL.B. 1966, University of Texas at Austin	Va.
Seckic, Miomir Diploma in Law 1961, University of Belgrade, Yugoslavia	D.C.	Schwartz, Howard S. B.B.A. 1959, University of Miami J.D. 1963, George Washington University	Va.
Schatzow, Steven B.A. 1966, Yale University J.D. 1969, University of Chicago	Md.		

Schwartz, J. I. Milton	S.D.	Sloniewsky, Roman W.	Va.
B.A. 1961, J.D. 1966, University of South Dakota		B.S. 1962, St. Peter's College, N.J.	
Schwed, Michael B.	Md.	LL.B. 1965, Rutgers, the State University	D.C.
B.A. 1963, J.D. 1966, American University		Smith, John C., Jr.	
Scott, Howard F.	Va.	B.A. 1964, Creighton University	
B.B.A. 1965, J.D. 1968, Ohio State University		J.D. 1967, Howard University	Ind.
Sellergren, David C.	Md.	Smith, Julius E.	
B.A. 1965, Grinnell College		B.A. 1966, Earlham College	
J.D. 1968, University of Minnesota		J.D. 1969, Howard University	N.Y.
Serafin, Andrew J.	D.C.	Smith, Neil A.	
D.S. 1966, King's College, Pa.		B.A. 1964, B.S. 1966, J.D. 1969, Columbia University	D.C.
J.D. 1969, American University		Snider, Ronald R.	
Sevilla, Charles M.	Calif.	B.S. in E.E. 1960, Purdue University	
B.A. 1966, San Jose State College		LL.B. 1963, University of Michigan	N.Y.
J.D. 1969, University of Santa Clara		Sobel, Thomas M.	
Seymour, Hiram P.	Fla.	B.A. 1965, Columbia University	
LL.B. 1967, Florida Agricultural and Mechanical University		LL.B. 1968, Boston University	Mich.
Shallal, Suham S.	Iraq	Solomon, Larry S.	
LL.B. 1959, University of Baghdad, Iraq		J.D. 1968, Detroit College of Law	Va.
M.Comp.L. 1967, George Washington University		Speer, Raymond M.	Va.
Shor, David	N.J.	B.S. 1964, J.D. 1968, Samford University	
B.A. 1965, New York University		Steel, Richard D.	
LL.B. 1968, Boston University		B.A. 1963, Dickinson College	Del.
Short, Laurence A.	D.C.	LL.B. 1966, University of Pennsylvania	
B.S. 1951, St. Louis University		Steele, Joseph R.	
LL.B. 1958, Georgetown University		B.S. 1963, University of Delaware	
Singh, Mandev	India	J.D. 1966, Dickinson School of Law	Md.
B.A. 1951, Khalsa College, India		Steinmark, Stuart R.	
LL.B. 1953, Law College, Jullundur, India		B.S. 1962, Lehigh University	
Skaggs, David E.	Va.	LL.B. 1965, Rutgers, the State University	Ky.
B.A. 1964, Wesleyan University		Steutermann, Edward M.	
LL.B. 1967, Yale University		B.Ch.E. 1959, LL.B. 1964, University of Louisville	Md.
Skerritt, Daniel H.	Va.	Stone, Beverly G.	
B.A. 1965, J.D. 1968, Willamette University		LL.B. 1952, Brooklyn Law School	D.C.
Skiles, James H.	D.C.	Streinz, Clara J.	
B.A. 1966, Dartmouth College		J.D. 1949, LL.M. 1950, George Washington University	Mo.
J.D. 1969, Georgetown University		Stutzman, Myron D.	
Skirble, Joel H.	D.C.	B.S. in I.E. 1961, Stanford University	
B.A. 1966, Pennsylvania State University		J.D. 1967, Samford University	Miss.
J.D. 1969, University of Pittsburgh		Swayze, Charles J., Jr.	
Slomoff, Robert J.	Md.	B.B.A. 1966, J.D. 1969, University of Mississippi	
B.S. 1965, Wayne State University			
LL.B. 1968, University of Maryland			

T

Tennant, David P.	D.C.	Trocki, Daniel B.	Va.
B.S. 1961, LL.B. 1964, University of Wisconsin		B.S. 1954, Bloomsburg State College	
Thurman, Ronald V.	Utah	LL.B. 1957, Temple University	Md.
B.E.S. 1965, Brigham Young University		Tucker, Simon	
J.D. 1968, University of Utah		B.S. in S.S. 1940, City College, New York	
Tidwell, Moody D., III	Va.	M.P.A. 1942, New York University	
B.A. 1961, Ohio Wesleyan University		J.D. 1953, LL.M. 1955, George Washington University	Md.
J.D. 1965, American University		Tuft, Mark L.	
Tigner, James G.	Va.	B.S. 1965, University of Oregon	
B.S. 1961, New Mexico State University		J.D. 1969, Hastings College of the Law	N.Y.
LL.B. 1965, Baylor University		Tully, John L., Jr.	
Tobin, Maurice B.	Va.	B.B.A. 1953, Siena College	
B.S. 1955, St. Benedict's College		LL.B. 1961, Catholic University of America	
J.D. 1959, University of Kansas			
Trattner, Jeffrey B.	Va.		
B.A. 1964, LL.B. 1966, Brooklyn Law School			

U

Urey, David S.	D.C.	Utz, Billy N.	Va.
B.S. in I.E. 1958, Northwestern University		B.S. 1961, Virginia Polytechnic Institute	
J.D. 1964, George Washington University		LL.B. 1964, American University	

V

Vander Weide, Vernon J. B.A. 1962, LL.B. 1965, University of Michigan	Mich.	Van Wert, Ronald K. B.A. 1965, University of California, Santa Barbara J.D. 1968, Hastings College of the Law	Va.
		Vidana, Luis H. LL.B. 1941, University of Havana, Cuba	Cuba

W

Wahl, Eric J. B.S. 1964, J.D. 1967, University of Wisconsin	Va.	West, Luther C. B.A. 1948, Birmingham-Southern College LL.B. 1950, George Washington University	Ala.
Wallach, Frederick E. B.A. 1959, Williams College J.D. 1962, Harvard University	Md.	White, Lamont N. B.A. 1966, Florida Agricultural and Mechanical University J.D. 1970, Howard University	D.C.
Wasser, Nathan H. B.A. 1964, University of Maryland LL.B. 1967, Catholic University of America	Md.	White, Timothy M. B.A. 1964, J.D. 1967, University of Minnesota	Minn.
Watkins, Linda L. B.A. 1963, Mary Washington College of the University of Virginia B.C.L. 1965, College of William and Mary	Va.	Whitestone, Robert C. B.S. 1964, LL.B. 1967, University of Virginia	Va.
Weiler, John J. B.A. 1966, University of Minnesota J.D. 1969, Creighton University	Va.	Whitten, William M., III B.A. 1960, B.C.L. 1963, College of William and Mary	Va.
Weine, Nelson S. B.A. 1965, Miami University J.D. 1968, Ohio State University	D.C.	Wilder, Roland P., Jr. B.A. 1963, Washington and Jefferson College LL.B. 1966, Vanderbilt University	Va.
Weinrieb, Steven W. B.A.E. 1966, Rensselaer Polytechnic Institute J.D. 1969, Brooklyn Law School	N.Y.	Wiles, Ernest E. B.S. 1940, University of Kansas LL.B. 1943, Yale University	D.C.
Welch, Gerard S., Jr. B.S. 1957, Seattle University LL.B. 1967, Catholic University of America	Va.	Wilken, William J. B.A. 1949, University of Iowa LL.B. 1959, George Washington University	Va.
Wenker, Paul F. B.S. 1964, Xavier University, Ohio J.D. 1967, Georgetown University	D.C.	Wilson, Stephen V. B.A. 1962, Lehigh University LL.B. 1966, Brooklyn Law School	D.C.
Wesley, Roger C. B.S. 1962, M.A. 1966, University of Southern California J.D. 1969, George Washington University	Calif.		

Y

Yoo, Byong K. LL.B. 1961, LL.M. 1963, Korea University	Korea
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Z

Zafren, Daniel H. B.A. 1961, Queens College, N.Y. LL.B. 1964, New York University	N.Y.	Zeitler, Wilhelm A. B.S. 1965, Georgetown University LL.B. 1968, University of Virginia	Va.
Zdravkovic, Dusan LL.B. 1962, University of Belgrade, Yugoslavia	Md.	Zinober, Peter W. B.A. 1959, J.D. 1969, University of Florida	D.C.
Zegrea, Nick G. B.S. in I.E. 1959, LL.B. 1962, West Virginia University	Md.		

Institutions in Which Law Center Students Earned Degrees*

Adelphi University	2	Albion College	1
Akron, University of	2	Aleppo, University of, Syria	1
Alabama, University of	2	Alfred University	2
Alaska, University of	1	American University	36

* Figures represent students registered during the spring semester 1970.

Amherst College	3	Centenary College	1
Anohra University, India	1	Central Connecticut State College..	1
Antioch College	1	Central Michigan University	1
Arizona State University	2	Central Missouri State College	2
Arizona, University of	4	Central State University	2
Athens, University of, Greece	1	Chicago, University of	1
Bagdad, University of, Iraq	1	Christian Brothers College	6
Ball State University	1	Cincinnati, University of	1
Bard College	1	Citadel, The	1
Barnard College	4	Claflin College	2
Bates College	1	Claremont Men's College	1
Baylor University	3	Clarion State College	1
Belgrade, University of, Yugoslavia	2	Clark University	1
Beloit College	1	Clarkson College of Technology	2
Berea College	1	Cleveland-Marshall Law School	1
Birmingham-Southern College	1	Coe College	2
Blackburn College	2	Colby College	3
Bloomsburg State College	1	Colgate University	1
Bob Jones University	1	Colorado College	1
Boston College	7	Colorado State University	2
Boston University	23	Colorado, University of	24
Bowdoin College	2	Columbia University	1
Bowie State College	1	Concordia College, Moorhead,	1
Bowling Green State University	3	Minn.	5
Brandeis University	4	Connecticut, University of	3
Bridgeport, University of	3	Cooper Union	12
Brigham Young University	16	Cornell University	5
British Columbia, University of ...	1	Creighton University	1
Brooklyn College	16	Cumberland University	1
Brooklyn Law School	10	D. C. Teachers College	1
Brown University	10	Damascus, University of, Syria	14
Bucknell University	6	Dartmouth College	1
Buenos Aires, University of,		Davidson College	1
Argentina	1	Davis and Elkins College	3
C. W. Post College	4	Dayton, University of	6
Cairo University, Egypt	3	Delaware, University of	11
California Maritime Academy	1	Denison University	5
California State College at		Denver, University of	2
Fullerton	1	DePaul University	1
California State College at		DePauw University	2
Hayward	1	Detroit College of Law	2
California State College at		Detroit, University of	12
Los Angeles	2	Dickinson College	4
California, University of, Berkeley	11	Dickinson School of Law	3
California, University of,		Drake University	3
Los Angeles	7	Drew University	5
California, University of, Riverside	1	Drexel Institute of Technology	8
California, University of,		Duke University	1
Santa Barbara	3	Dunbarton College of Holy Cross	2
Calvin College	1	Duquesne University	1
Carnegie-Mellon University	3	D'Youville College	1
Case Western Reserve University ..	11	Earlham College	4
Catholic University, Valparaiso,		Eastern College	3
Chile	1	Emory University	1
Catholic University of America	11	Fairfield University	1
Catholic University of Puerto Rico	1		

Florida Agricultural and Mechanical University	4	Korea University	1
Florida Southern College	1	Kyungpook National University, Korea	1
Florida State University	2	Lafayette College	8
Florida, University of	8	LaSalle College	3
Fordham University	10	LaSalle Extension University	1
Franklin and Marshall College	12	Law College, Jullundur, India	1
Franklin Pierce College	1	Lehigh University	11
Fresno State College	1	Le Moyne College	1
Frostburg State College	1	Lewis and Clark College	2
Furman University	1	Lincoln University, Pa.	3
George Washington University	146	London, University of, England	2
Georgetown University	52	Long Island University	1
Georgia Institute of Technology....	4	Louisiana Polytechnic Institute	2
Gettysburg College	3	Louisiana State University	3
Glasgow, University of, Scotland....	1	Louisville, University of	4
Goucher College	1	Loyola, University of, Ill.	2
Government Law College, India....	1	Loyola, University of, La.	1
Grinnell College	2	Lycoming College	1
Guilford College	1	Lynchburg College	1
Gujarat University, India	1	Madison College	1
Hamilton College	1	Maine, University of	3
Hampton Institute	2	Manhattan College	1
Hanover College	2	Marietta College	3
Harvard University	14	Marquette University	6
Hastings College of the Law	4	Mary Washington College of the University of Virginia	1
Havana, University of, Cuba	2	Maryland, University of	48
Haverford College	1	Maryville College	1
Hawaii, University of	5	Massachusetts Institute of Technology	4
Hiram College	1	Massachusetts, University of.....	4
Hobart College	4	McGill University, Canada	1
Hofstra University	2	Memphis State University	1
Holy Cross, College of the	9	Merrimack College	1
Houston, University of	4	Miami University	9
Howard University	21	Miami, University of	12
Hunter College	4	Michigan State University	8
Idaho, University of	5	Michigan, University of	38
Illinois, University of	10	Middlebury College	3
Indiana University	7	Mills College	1
Iowa State University of Science and Technology	6	Milton College	1
Iowa, University of.....	7	Minnesota, University of	10
John Carroll University	3	Mississippi, University of	3
John Marshall Law School	2	Missouri, University of	5
Johns Hopkins University	11	Monmouth College, Ill.	1
Kalamazoo College	1	Montana State University	1
Kansas State College of Pittsburg..	1	Montana, University of	2
Kansas State Teachers College	1	Montclair State College	1
Kansas State University of Agriculture and Applied Science	4	Morehead State University	1
Kansas, University of	7	Morehouse College	1
Kent State University	2	Morgan State College	1
Kentucky, University of	1	Morris Brown College	1
Khalsa College, India	1	Mount Holyoke College	2
King's College, Pa.	2	Mount St. Mary's College, Md.	2
Knox College	1	Mount Union College	1

National Cheng-chi University, Taiwan	1	Pittsburgh, University of	19
National Taiwan University	1	Pomona College	1
Nebraska, University of	3	Princeton University	8
Nebraska, University of, at Omaha	1	Providence College	5
Nebraska Wesleyan University	2	Puerto Rico, University of	1
Nevada Southern University	2	Purdue University	12
Nevada, University of	1	Queens College, N.Y.	19
New Hampshire, University of	2	Radcliffe College	1
New Haven College	1	Randolph-Macon College	1
New Mexico Highlands University	1	Redlands, University of	7
New Mexico State University	2	Rensselaer Polytechnic Institute	1
New York, City College	20	Rhode Island College	2
New York Law School	1	Rhode Island, University of	1
New York, State University of, at Binghamton	1	Rice University	1
New York, State University of, at Buffalo	3	Richmond, University of	1
New York University	32	Roanoke College	10
Newark College of Engineering.....	2	Rochester, University of	1
Newton College of the Sacred Heart	2	Rockford College	1
Niagara University	1	Rollins College	1
North Carolina State University at Raleigh	1	Roosevelt University	21
North Carolina, University of, at Chapel Hill	14	Rutgers, the State University	1
North Carolina, University of, at Greensboro	1	St. Ambrose College	1
North Dakota, University of	1	St. Anselm's College	1
Northeastern University	2	St. Benedict's College	1
Northland College	1	St. Bonaventure University	1
Northwest Missouri State College..	1	St. Francis Seminary	1
Northwestern Oklahoma State University	1	St. John Fisher College, Inc.	1
Northwestern University	8	St. John's University, Minn.	6
Notre Dame, University of	11	St. John's University, N.Y.	1
Oakland University	1	St. Joseph's College, Pa.	1
Oberlin College	3	St. Lawrence University	5
Occidental College	1	St. Louis University	2
Oglethorpe College	1	St. Olaf College	2
Ohio Northern University	2	St. Peter's College, N.J.	2
Ohio State University	18	Samford University	1
Ohio University	6	San Beda College, Philippines	2
Ohio Wesleyan University	4	San Diego State College	1
Oklahoma City University	1	San Diego, University of	1
Oklahoma State University	1	San Francisco State College	1
Oklahoma, University of.....	5	San Francisco, University of	1
Olivet College	1	San Jose State College	1
Olivet Nazarene College	1	San Juan de Letran, Collegio de, Philippines	1
Oregon State University	2	Santa Clara, University of	2
Oregon, University of	2	Seattle University	1
Oxford University, England	2	Seton Hall University	1
Pan American College	1	Sharia College, Saudi Arabia	1
Pennsylvania State University	23	Siena College	7
Pennsylvania, University of	39	Skidmore College	1
		Smith College	6
		South Carolina State College	1
		South Carolina, University of	1
		South Dakota State University	2
		South Dakota, University of	2
		South Texas College of Law	2
		South, University of the	

Southeast Missouri State College..	2	Vassar College	5
Southern California, University of..	4	Vermont, University of	7
Southern Connecticut State College	1	Villanova University	9
Southern Methodist University	6	Virginia Military Institute	1
Southern State College, Ark.	1	Virginia Polytechnic Institute	8
Southwestern at Memphis	1	Virginia Union University	3
Spelman College	1	Virginia, University of	22
Stanford University	12	Wabash College	1
Stetson University	1	Wake Forest University	3
Stevens Institute of Technology	2	Washburn University of Topeka	2
Suffolk University	2	Washington and Jefferson College..	6
Swarthmore College	1	Washington and Lee University	9
Sweet Briar College	2	Washington State University	1
Syracuse University	17	Washington University	6
Temple University	8	Washington, University of	11
Tennessee Agricultural and		Wayne State University	4
Industrial State University	1	Weber State College	1
Tennessee, University of	4	Wellesley College	5
Tennessee, University of, at		Wesleyan University	6
Chattanooga	2	West Virginia State College	1
Texas A&M University	4	West Virginia University	4
Texas Christian University	2	Western College for Women	1
Texas Southern University	1	Western Kentucky University	3
Texas Technological University	2	Western Michigan University	1
Texas, University of, at Austin	15	Westminster College, Mo.	1
Thammasat University, Thailand....	1	Wheaton College	3
Toledo, University of	1	Wheelock College	1
Tougaloo College	2	Whitman College	1
Transylvania College	1	Wichita State University	2
Trinity College, Conn.	3	Wilkes College	2
Trinity College, D.C.	1	Willamette University	2
Trinity University	1	William and Mary, College of	8
Tufts University	8	Williams College	7
Tulane University of Louisiana	6	Wilson College	1
Tulsa, University of	1	Wisconsin State University,	
Union College, N.Y.	3	Platteville	1
U.S. Air Force Academy	8	Wisconsin State University,	
U.S. Coast Guard Academy	4	River Falls	1
U.S. International University	1	Wisconsin, University of	35
U.S. Merchant Marine Academy....	1	Wisconsin, University of,	
U.S. Military Academy	6	Milwaukee	1
U.S. Naval Academy	10	Wittenberg University	2
Ursinus College	1	Worcester Polytechnic Institute	1
Utah State University of		Wyoming, University of	2
Agriculture and Applied Science	1	Xavier University, Ohio	2
Utah, University of	9	Yale University	21
Vanderbilt University	6	Yeshiva University	1

Summary of Registration, Fall Semester 1969-70

	1st year	2d year	3d year	4th year	Graduate
Day					
Evening	404	260	186	—	47
Total: 1,659	121	115	104	67	355

APPENDIX: RECENTLY ESTABLISHED REGULATIONS

THE FOLLOWING UNIVERSITY REGULATIONS are under review and may be subject to change in connection with the establishment of judicial processes. Bulletins and handbooks incorporating any changes will be issued as appropriate.

The following resolution, submitted by the University Senate, was approved by the University's Board of Trustees on October 19, 1968:

Whereas, safety and order are essential preconditions of the learning process, and indeed of the very concept of a university; and

Whereas, The George Washington University is committed to protection of free speech and freedom of assembly, and to safeguarding the right of lawful protest on campus; and is committed equally to maintaining the peace and safety of the campus, in the knowledge that all rights are in jeopardy when violence and civil disorder prevail over law and reason;

Now, therefore, be it resolved by the Senate of The George Washington University: that in the event a demonstration at this University exceeds the bounds of free assembly and lawful advocacy, and demonstrators are engaging in unlawful acts which cause or imminently threaten injury to persons or property, or which obstruct or interfere with normal and necessary University activities, this body affirms the authority of the President, or other University officials designated to act in his absence, to take such reasonable steps, if possible after consultation with the Chairman of the Executive Committee of the University Senate and the President of the Student Body, as are required to restore and preserve order; including, if deemed necessary and appropriate, suspension of students or faculty engaging in such acts, and use of such law enforcement personnel as are needed to effect the removal, arrest, and prosecution of law violators. Any such suspension shall be reviewed by an appropriate tribunal as soon after order is restored as is practicably possible.

The following was approved by the University's Board of Trustees on October 19, 1968:

Any student suspended from The George Washington University on the grounds of exceeding the bounds of free assembly and lawful advocacy shall have his suspension reviewed by the Hearing Committee on Student Affairs of The George Washington University as soon after order is restored as is practicable possible.

The following resolution, submitted by the Student Life Committee, was approved by the University's Board of Trustees on October 19, 1968:

Be it resolved that The George Washington University: affirms its traditional commitment to freedom of expression (a) by continuing to permit business and government organizations which are recruiting employees to conduct their activities at designated places on campus, and (b) by placing no obstacle to students who may wish to protest the presence of such recruiters, provided, however, that such protest shall be orderly and shall not impede or disrupt the recruiter in his activities.

The University affirms its place as a forum for the free exchange of ideas (a) by assuring that guests invited to speak on this campus at duly scheduled meetings shall have the right to appear and to be heard, and (b) by sanctioning the freedom of students to express dissent from the views of the speaker, provided, however, that that expression of dissent be orderly and nonobstructive.

The University distinguishes between orderly protest and resistance-by-obstruction; it accepts the former as a legitimate expression of dissent while rejecting the latter as an abridgement of the freedoms of the individuals who may be its object.

The following was approved by the University's Board of Trustees on October 19, 1968:

The George Washington University is opposed to discrimination based on race, color, or creed. Such discrimination may have appeared in campus organizations in the past. In the future, however, no organization can be recognized or supported by the University unless it provides continued assurance of nondiscrimination in membership practices and in intent, considered adequate by relevant committees and officers of the University.

The following was approved by the University's Board of Trustees on October 19, 1968:

The University cannot condone violations of law, including violation of those laws which proscribe possession, use, sale, or distribution of certain drugs. Members of the academic community should know that administrative action, which may include dismissal from the residence halls, revocation of other privileges, or suspension or dismissal from the University, may be taken in order to protect the interests of the University and the rights of others.

The Board of Trustees reaffirms the responsibility of the President and the Faculty to continue to implement this policy.

The following resolution, submitted by the University Senate, was approved by the University's Board of Trustees on January 16, 1969:

Be it resolved by the Senate of The George Washington University: Any member of the University (including as members of the University all persons having a formal connection with the University)

(a) who engages in conduct that unreasonably obstructs teaching, research, and learning, or

(b) who unreasonably obstructs free access to members or guests of the University or to University buildings, or

(c) who disobeys general regulations of the University, or

(d) who damages University property or injures members or guests of the University,

may be punished for his conduct by dismissal from the University, or by some lesser disciplinary action, through procedures established within the University for the government of its members.

In order to insure due process, any student subject to dismissal or other disciplinary action on the grounds of violating any of the premises of this resolution shall have, at his discretion, the right of review of the action by the University Hearing Committee on Student Affairs.

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NATIONAL LAW CENTER, Dean of the Center

SCHOOL OF ENGINEERING AND APPLIED SCIENCE, Dean of the School

UNDERGRADUATE AND GRADUATE CATALOGUE (Arts and Sciences, Education, Government and Business Administration, Public and International Affairs), Office of Admissions

SCHOOL OF MEDICINE, Admissions Office, School of Medicine

SUMMER SESSIONS, Dean of the Summer Sessions

SCHEDULE OF CLASSES: FALL AND SPRING SEMESTERS, Registrar

SCHEDULE OF CLASSES: SUMMER SESSIONS, Dean of the Summer Sessions

COLLEGES AND SCHOOLS—DEGREE PROGRAMS

COLUMBIAN COLLEGE OF ARTS AND SCIENCES: Associate in Arts (A.A.), Bachelor of Arts (B.A.), Bachelor of General Studies (B.Gen.Std.), Bachelor of Science (B.S.), Bachelor of Science in Environmental Health (B.S. in Env.Health), Bachelor of Science in Geodetic and Cartographic Science (B.S. in Geod. and Cart.Sc.), Bachelor of Science in Medical Technology (B.S. in Med.Tech.), and Bachelor of Science in Oceanography (B.S. in Ocea.)

GRADUATE SCHOOL OF ARTS AND SCIENCES: Master of Arts (M.A.), Master of Fine Arts (M.F.A.), Master of Music (Mus.M.), Master of Science (M.S.), and Doctor of Philosophy (Ph.D.)

SCHOOL OF MEDICINE: Doctor of Medicine (M.D.)

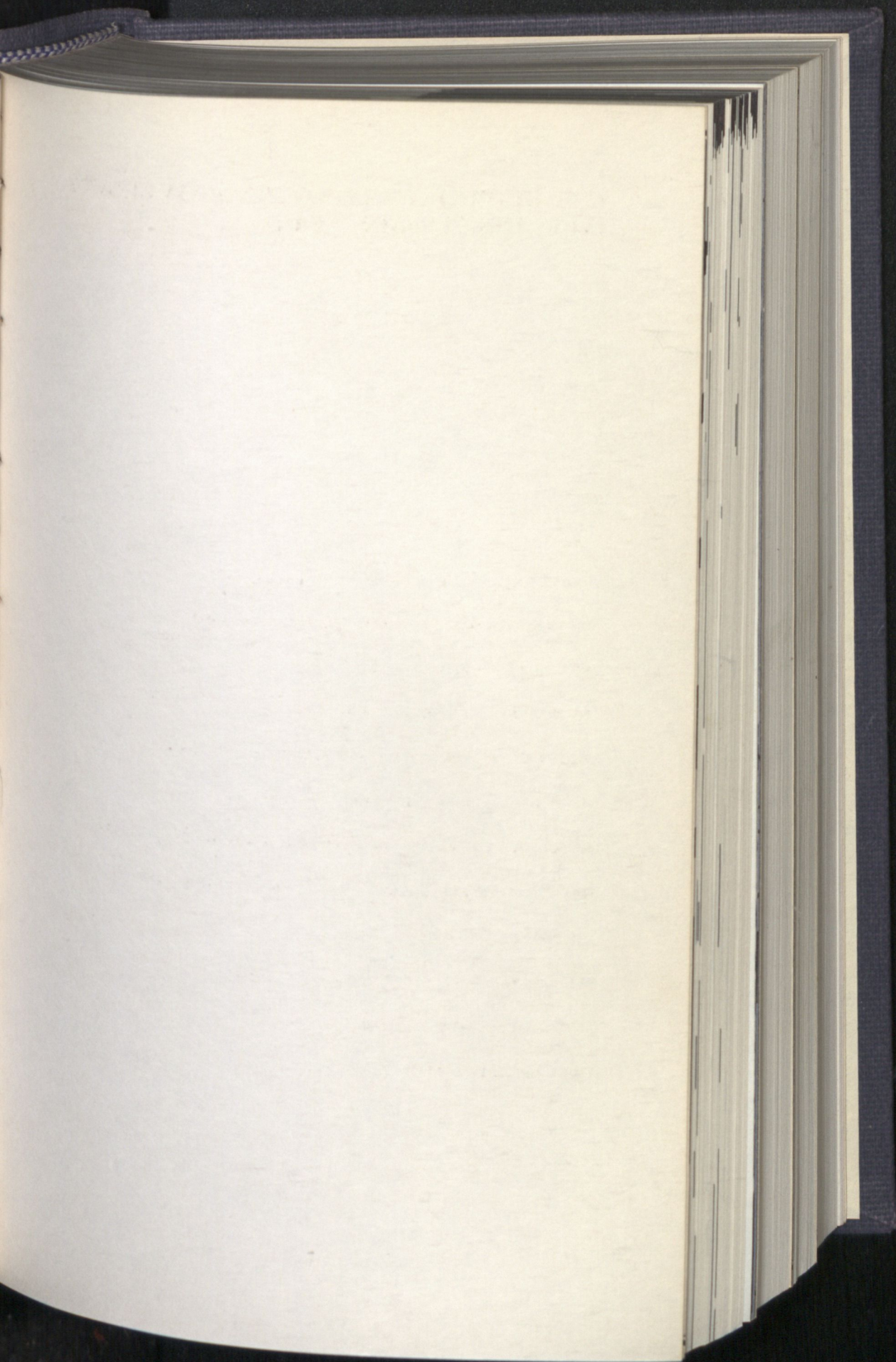
NATIONAL LAW CENTER: Juris Doctor (J.D.), Master of Laws (LL.M.), Master of Comparative Law (M.Comp.L.), Master of Comparative Law (American Practice) (M.Comp.L.(Am.Prac.)), and Doctor of Juridical Science (S.J.D.)

SCHOOL OF ENGINEERING AND APPLIED SCIENCE: Bachelor of Science (Civil Engineering) (B.S. (C.E.)), Bachelor of Science (Electrical Engineering) (B.S. (E.E.)), Bachelor of Science (Measurement Science) (B.S. (Meas.S.)), Bachelor of Science (Mechanical Engineering) (B.S. (M.E.)), Master of Science (M.S.), Master of Engineering Administration (M.E.A.), and Doctor of Science (D.Sc.)

SCHOOL OF EDUCATION: Bachelor of Arts in Education (B.A. in Ed.), Bachelor of Science in Physical Education (B.S. in P.E.), Master of Arts in Teaching (M.A.T.), Master of Arts in Education (M.A. in Ed.), Education Specialist (Ed.S.), and Doctor of Education (Ed.D.)

SCHOOL OF GOVERNMENT AND BUSINESS ADMINISTRATION: Bachelor of Business Administration (B.B.A.), Bachelor of Science in General Studies (B.S. in Gen.Std.), Master of Arts in Government (M.A. in Govt.), Master of Administration in Health Care Administration (M.A. in H.C.A.), Master of Business Administration (M.B.A.), Master of Public Administration (M.P.A.), Master of Science in Administration (M.S. in Adm.), Master of Urban and Regional Planning (M. of Urb. and Reg.Plan.), Graduate Certificate in Health Care Administration (Grad.Cert. in H.C.A.), Doctor of Business Administration (D.B.A.), and Doctor of Public Administration (D.P.A.)

SCHOOL OF PUBLIC AND INTERNATIONAL AFFAIRS: Bachelor of Arts (B.A.), Certificate of the Institute for Sino-Soviet Studies (Cert. of I.S.S.S.), Master of Arts (M.A.), and Master of Science in International Affairs (M.S. in I.A.)



**THE GEORGE WASHINGTON UNIVERSITY
150TH ANNIVERSARY YEAR**

COLUMBIAN COLLEGE OF ARTS AND SCIENCES, 1821

THE GRADUATE SCHOOL OF ARTS AND SCIENCES, 1893

THE SCHOOL OF MEDICINE, 1825

THE NATIONAL LAW CENTER, 1865

THE SCHOOL OF ENGINEERING AND APPLIED SCIENCE, 1884

THE SCHOOL OF EDUCATION, 1907

THE SCHOOL OF GOVERNMENT AND BUSINESS ADMINISTRATION, 1928

THE SCHOOL OF PUBLIC AND INTERNATIONAL AFFAIRS, 1928

THE COLLEGE OF GENERAL STUDIES, 1950

THE DIVISION OF UNIVERSITY STUDENTS, 1930

THE SUMMER SESSIONS, 1916

THE UNIVERSITY HOSPITAL, 1898

THE GEORGE WASHINGTON UNIVERSITY BULLETIN




SCHOOL
OF
ENGINEERING
AND
APPLIED SCIENCE



1970-1971

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THE GEORGE WASHINGTON UNIVERSITY BULLETIN

THE SCHOOL OF ENGINEERING
AND APPLIED SCIENCE 1970-71

WASHINGTON, D.C. 20006



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THE CALENDAR 1970-71

1970-71 FALL SEMESTER

<i>September 11</i>	Orientation for students from foreign countries <i>Friday</i>
<i>September 15</i>	Placement tests for entering students <i>Tuesday</i>
<i>September 15-16</i>	Advising for all students <i>Tuesday-Wednesday</i>
<i>September 17-19</i>	Registration—Tompkins Hall of Engineering <i>Thursday-Saturday</i>
	Application for February graduation due as part of registration
<i>September 21</i>	Classes begin <i>Monday</i>
<i>November 11</i>	Veterans Day (holiday) <i>Wednesday</i>
<i>November 25</i>	Thanksgiving recess begins after last class <i>Wednesday</i>
<i>November 30</i>	Classes resume <i>Monday</i>
<i>December 7</i>	D.Sc. dissertations of February candidates due <i>Monday</i>
<i>*December 19</i>	Last day of fall-semester classes <i>Saturday</i>
<i>December 19</i>	Christmas recess begins after last class <i>Saturday</i>
<i>January 4</i>	Master's theses of February candidates due <i>Monday</i>
<i>January 4-8</i>	Fall-semester reading period <i>Monday-Friday</i>
<i>January 9-21</i>	Examination period <i>Saturday-Thursday</i>

1971 SPRING SEMESTER

<i>January 25</i>	Placement tests and waiver examinations <i>Monday</i>
<i>January 25-27</i>	Advising for all students <i>Monday-Wednesday</i>
<i>January 28-30</i>	Registration—Tompkins Hall of Engineering <i>Thursday-Saturday</i>
	Application for June graduation due as part of registration
<i>February 1</i>	Spring-semester classes begin <i>Monday</i>
<i>February 15</i>	Winter Convocation (holiday) <i>Monday</i>
<i>March 30</i>	D.Sc. dissertations of June candidates due <i>Tuesday</i>
<i>April 3</i>	Spring recess begins after last class <i>Saturday</i>
<i>April 13</i>	Classes resume <i>Tuesday</i>
<i>April 23</i>	Master's theses of June candidates due <i>Friday</i>
<i>*May 8</i>	Last day of spring-semester classes <i>Saturday</i>
<i>May 10-14</i>	Spring-semester reading period <i>Monday-Friday</i>
<i>May 15-27</i>	Examination period <i>Saturday-Thursday</i>
<i>May 31</i>	Memorial Day (holiday) <i>Monday</i>
<i>June 6</i>	Commencement <i>Sunday</i>

1971 SUMMER SESSIONS

<i>June 14</i>	Registration for first 5-week session and 8-week courses <i>Monday</i>
<i>June 15</i>	First 5-week session and 8-week courses begin <i>Tuesday</i>
<i>July 21</i>	First 5-week session ends <i>Wednesday</i>
<i>July 22</i>	Registration for second 5-week session <i>Thursday</i>
<i>July 23</i>	Second 5-week session classes begin <i>Friday</i>
<i>August 6</i>	Eight-week courses end <i>Friday</i>
<i>August 27</i>	Second 5-week session ends <i>Friday</i>

1971-72 FALL SEMESTER

<i>September 16-18</i>	Registration <i>Thursday-Saturday</i>
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* Courses offered by the School of Engineering and Applied Science, as well as certain courses in other divisions of the University, may be extended through the reading period.

1970

JULY

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1971

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MAY

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THE CALENDAR 1976
CIVIL
SEPTEMBER
OCTOBER
NOVEMBER
DECEMBER
JANUARY
FEBRUARY
MARCH
APRIL
MAY
JUNE
JULY
AUGUST
TO ALL PROSPECTIVE STUDENTS:

This catalogue describes the programs and requirements for undergraduate and graduate study in the School of Engineering and Applied Science. It also includes descriptions of courses; a listing of the faculty and staff; and information on fees, financial regulations and aid, and student services and activities.

The School of Engineering and Applied Science is a professional school in a university comprised of eight degree-granting schools and colleges. The environment of the Nation's Capital is very favorable for the intellectual and cultural development of the student. The metropolitan Washington area contains the second largest concentration of research and development in the United States, and the engineering component of this activity is similarly extensive.

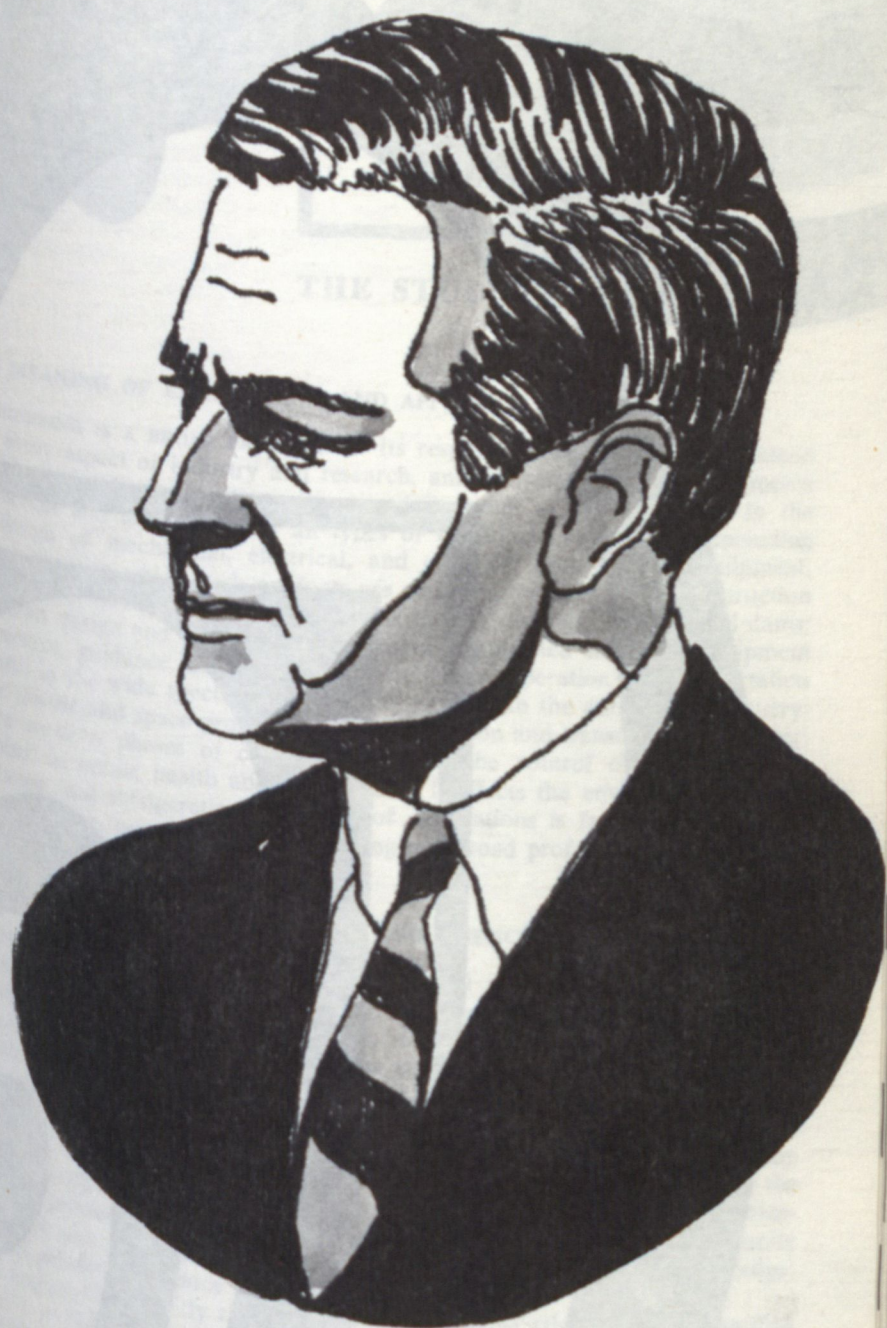
The School of Engineering and Applied Science has been in continuous session since 1884, and offers programs of study leading to Bachelor's, Master's, and Doctor's degrees. Its prime objective is to educate the student so that he will have the precious asset of a well-trained mind which may be applied to the attainment of our many national objectives. In these changing times, it is necessary to search for quality. Students and faculty are required to perform a certain amount of soul-searching. All should have the opportunity of assisting in the planning and implementation of educational programs. Examination is being made periodically of the School's objectives and how they relate to those established by the American Society for Engineering Education. Emphasis includes such items as the student's basic and advanced levels of education and his role in present and future society.

The atmosphere of the School is one of serious-minded effort toward mature development. Being a small school, it recognizes the individual as the single most important element in the educational process. The student body, undergraduate and graduate, has a primary interest in design, research, development, and management in both scientific and engineering activities. Many alumni of the School are successfully engaged in all fields of engineering—in science, management, government, and education.

The philosophy of the School, which might be summarized as "education for creativity, not conformity," has through the years reflected the many subtle and profound changes in the engineering profession.

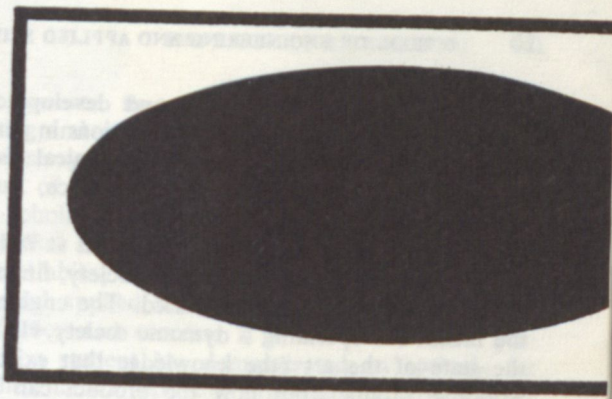
The faculty of the School and I look forward to providing a closer and more fruitful relationship with you. If you need additional information, please do not hesitate to call upon the Department Chairmen or me.

HAROLD LIEBOWITZ
Dean
School of Engineering and
Applied Science



Harold Liebowitz, Dean of the School of Engineering and Applied Science





THE STUDY OF ENGINEERING

THE MEANING OF ENGINEERING AND APPLIED SCIENCE

ENGINEERING IS A BROAD PROFESSION. Its responsibilities and activities extend into every aspect of industry and research, and into many fields of commerce and the arts. Engineers have faced and continue to face problems in the production and distribution of all types of manufactured products, including the design of mechanical, electrical, and chemical processes, of equipment, and of plants in which such products are made; in the design and construction of an infinite variety of structures such as bridges, tunnels, harbors, and dams; in aircraft design and construction, including complicated electronic equipment for control, guidance, and communication; in the operation of transportation systems; in the wide spectrum of activities existing in the automotive industry; in the missile and space programs; in the generation and transmission of power; in the modern phases of communication; in the control of traffic; in city planning; in public health and sanitation as it affects the environment; and in ventilation and refrigeration. This list of applications is far from exhaustive; it does indicate, however, that engineering is a broad profession in which there are many specialists.

THE RELATIONSHIP OF ENGINEERING AND SCIENCE

In any discussion of "engineering and applied science," it is profitable to emphasize the distinction between engineering and science. The President's Scientific Advisory Committee points out that the engineer and scientist each play an important role on a team. "The scientist is one who seeks to extend the boundaries of knowledge in his chosen field. The engineer has the task of combining the knowledge of science with his knowledge and awareness of the needs and limitations of human beings and of a human society to develop and create things for human use. . . . While scientists have uncovered the basic knowledge, it is the engineers who have created the tangible tools, materials, and products that have revolutionized our daily lives, our community living, and our national defense." Scientists primarily produce knowledge; engineers primarily produce things.

The engineer frequently refines scientific knowledge (thus the term "applied science") to shape it to his purposes and society's needs. He possesses capabilities that are not usually a part of scientific training: he must know how

to proceed by analysis, design, and development of manufacturing, of construction, of electronics, and of operations in general using scientific knowledge as well as his own; and, since economical use of resources is a necessity, he must deal with public policy, finance, human relations, and economic considerations.

The work of engineers is a focal point at which scientific knowledge, the use of such knowledge as a service to society, financial material, human resources, and society's needs are interrelated. The engineer is concerned, therefore, with the means for operating a dynamic society. He must consider not only whether the state of the art (the knowledge that exists) will enable him to create a workable product, but how the product can be built, who will use it, how such use will affect what he builds, and the environmental conditions under which it will operate.

THE PROFESSIONAL ENGINEER

Engineers are concerned with the quality and security of human life—problems of great intellectual interest. Engineer, as the term is used in this catalogue and as it is commonly understood in our society, refers to the person who makes use of the advances of science and technology in an economically feasible manner for the benefit of society. This process is complex and challenging. Although the content of engineering curricula is certainly scientific, the engineer has not lost his sense of purpose in serving as an intellectual agent in the practical world. This responsibility of the engineer arises from the breadth of the implications of engineering for the whole of society as well as from the depth of the requirements for competence. Technology has radically rearranged human life in our time. There are many who believe that, although the threshold of space has been crossed, the union of medical and engineering practice has been achieved, and breakthroughs have been made in other areas, this impact of engineering on modern life is just a modest preview of the engineering of tomorrow.

THE ENGINEERING STUDENT

Rapidly changing and advancing engineering activity requires an education for the future based on fundamental principles of science useful in applications to a dynamic, advanced society. In the fields of engineering and applied science there is no substitute for demonstrated ability and competence to solve the problems faced. Without question, achievement in particular courses of study is important, but it is less important than the ability to analyze and interpret all the aspects of a problem, to formulate solutions, and to evaluate those solutions in the light of all available information. The undergraduate program of the School of Engineering and Applied Science provides a periodic evaluation and appraisal by a faculty adviser of the student's ability and progress.

The curricula of the School of Engineering and Applied Science are founded on one basic principle—to assist the student in preparing for a career in engineering and applied science. This philosophy requires that the student master the principles on which future practice will be based and that he receive an education centered on that meaningful junction between theory and practice so that throughout his professional life he can follow the interests and opportunities that develop in many directions.

It should not be assumed, however, that only the intellectual elite should consider the study of engineering and applied science. Engineering, like medicine, law, education, science, history, government, and other disciplines, does need top scholars. But in any of these areas, even though the prospective student has not achieved high scholastic standing, if he is genuinely interested in the subject, he can probably find a place for himself. Those who are moderately well-endowed with mental ability and who are interested and willing to work will find in engineering and applied science a rich and varied field of study which can lead to satisfaction and success. It is difficult to make generalizations in this area, but if a student has demonstrated an aptitude for mathematics, science, and English, he will probably find the work of engineers and the study of engineering and applied science satisfying and challenging. Innate intellectual curiosity and the desire to learn and to work hard are good indicators of success. College Board examinations may reveal the capacity to manage further study in mathematics and science and their applications to engineering. No school or college can "give" an education. It can offer only the opportunity to "get" an education. The George Washington University's School of Engineering and Applied Science is a small school which provides an opportunity for close liaison with faculty members, as well as the opportunity to participate in matters of student concern—in organizations, by working on the magazine, and through other student activities. The School recognizes the individual as the most important element in the educational process.



THE SCHOOL OF ENGINEERING AND APPLIED SCIENCE

HISTORY

THE SCHOOL OF ENGINEERING AND APPLIED SCIENCE was organized October 1, 1884, as the Corcoran Scientific School of Columbian University and was situated in the University Building then at 15th and H Streets, N.W. The School was named in honor of William W. Corcoran, Trustee and President of the Corporation from 1869 to 1888. Day and evening courses were offered in Literature, Science, and Technology and led to the degrees of Bachelor of Science, Civil Engineer, Mechanical Engineer, and Mining Engineer. The School was among the first to accept women for degree candidacy in engineering.

In 1903 the Corcoran Scientific School, the School of Graduate Studies, and the Columbian College were merged into a single Department of Arts and Sciences. Engineering degrees were made graduate.

Administrative changes led to The Washington College of Engineering being initiated in 1905 as one of the several semi-independent undergraduate colleges of the University, each with its own Board of Trustees. The College provided instruction leading to undergraduate degrees in engineering and architecture.

In 1909 the name of the College was changed to the College of Engineering and Mechanic Arts, and the curricula were revised to give the student a thorough understanding of the theory underlying engineering practice. Emphasis was placed on the development of a knowledge of scientific principles upon which the student could build and by which he might solve new problems as they are met in practice.

The name of the School was changed again in 1914 to the College of Engineering and later to the School of Engineering. Architecture was dropped from the curriculum, and degrees were limited to the field of engineering. However, the primary emphasis upon principles rather than technology which had characterized the School since 1903 was continued and has remained to this day as one of the important distinguishing features of the School.

In 1962 the name of the School became the School of Engineering and Applied Science.

ACADEMIC STATUS

The George Washington University is accredited by its regional accrediting agency, the Middle States Association of Colleges and Secondary Schools.

The University is on the approved list of the American Association of University Women and is a member of the College Entrance Examination Board.

The curricula in Civil Engineering, Electrical Engineering, and Mechanical Engineering are accredited by the Engineers' Council for Professional Development.

Undergraduate Study

THE UNDERGRADUATE PROGRAM is intended to provide a solid foundation in the basic principles, concepts, and techniques underlying engineering and applied science, on which the individual may build technical competence in a variety of areas as his professional career develops. It is preparation for a career in engineering or applied science, as it exists today and as it may develop in the future.

Undergraduate study is the formal beginning of a life-long continuing program of education. The School provides an environment that encourages and fosters the attitudes and disciplines essential to professional growth. The graduate, when he receives his Bachelor's degree, is prepared for productive work in his chosen field; he is also prepared for further development and progress, both formal and informal. The School insists that the undergraduate include in his study courses in the humanities and social sciences, to the extent necessary to develop a reasonable understanding and appreciation of these areas of knowledge. Cultivation in the intricacies of society and comprehension of human values are sought for the student, in complement to his scientific and technical literacy.

Admission indicates the student possesses at least minimum preparation and the probable capacity to meet the unusual educational demands of this School. However, the nature of the approach requires the student's real effort, intellectual discipline, and maturity. Because the School can predict neither the student's response to the demands made on him nor the program he should follow for his most effective development, it has designed an undergraduate program that offers a variety of experiences through which the student may find his own best path to maturity and growth in educational development.

The School is a place for learning; for experiencing adventures of the mind and of the hands; for the formulation, exchange, and exploration of ideas. During his undergraduate years the student is led to strengthen his skills in analysis and his talent for creative activity, through liberal use of project-type laboratory work. Independent thought and original ideas receive higher evaluation in the appraisal of student achievements, than the rote recital of information. The undergraduate program provides periodic evaluation and appraisal by a faculty adviser of the student's ability and progress.

ADMISSION TO UNDERGRADUATE STUDY

The School admits those applicants who can benefit themselves and society by disciplined intellectual effort in its environment.

Admission is the first selective step in a long series of qualifying steps the student will take in his progress toward professional competence in engineering, and indicates the School's belief that the applicant has at least the minimum preparation and ability to complete the curriculum successfully.

The applicant must be of good character and must have an academic background appropriate for the program of studies contemplated.

APPLICATION FOR ADMISSION

An applicant for admission obtains from the Office of Admissions of the University an application blank which he must fill out completely and return with the \$25* application fee.

STUDENTS FROM U. S. INSTITUTIONS

Records presented become the property of the University and *cannot* be returned.

FRESHMAN ADMISSION

Consideration for admission is based on the following:

1. An acceptable certificate of graduation from an accredited high school showing at least fifteen units†;
2. The principal's statement that the applicant is prepared to undertake college work;
3. Scores on the following College Entrance Examination Board tests: the Scholastic Aptitude Test, the English Composition Achievement Test, and a Level I (Standard) or Level II (Intensive) Mathematics Test—Level I preferred.

The qualifications of applicants who, because of unusual circumstances, do not meet the above requirements will be considered by the School, which may prescribe admission tests.

Nine and one-half of the fifteen units required for entrance must be distributed as follows: three in English, two in algebra, one in plane geometry, one-half in plane trigonometry, one in physics or chemistry, and two in one foreign language or history. General science may *not* be counted in satisfaction of the science requirement but may be counted as an elective unit.

It is recommended that *both* physics and chemistry be studied in high school. A high school course in solid geometry is recommended as a firm foundation for college mathematics.

An applicant must arrange to have sent directly *from his school to the Office of Admissions* the academic record of his first seven terms in secondary school, together with a personal evaluation and recommendation from his principal. This information may be supplied on a form provided by the University or on a standard form used by the secondary school provided all essential information is included.

* Application fee must be by check or postal money order, payable to George Washington University. The application fee is waived for a student applying for readmission who was registered as a degree candidate at the time of his last registration at this University and has not since registered at another institution.

† A unit represents a year's study in a secondary school subject, including in the aggregate not less than 120 sixty-minute periods of prepared classroom work.

Quantitative Deficiency.—A graduate of an approved high school who lacks not more than two units of the required subjects and who presents fifteen acceptable units may be admitted to a prescribed program which includes courses to make up his deficiencies.

REGULAR ADMISSION

Applicants for regular admission who wish to begin study in the fall semester should formulate plans early in the senior high school year. The University prefers to have applications submitted during the fall term of the senior high school year, although applications will be accepted up to March 1. Students graduating at midterm wishing to begin study in the spring semester *must* apply no later than December 1. Applications and all required credentials of students wishing to begin study in either the first or second term of the summer session must be received prior to March 1.

EARLY DECISION PLAN

For the qualified applicant who wants to begin college in the fall semester and receive an early guarantee of space, the University offers an early decision plan. The applicant need *only* indicate on the application form that he wishes an early decision and have all required credentials in the Office of Admissions prior to November 1. A decision will be mailed by December 15. The declaration of intent to attend the University and a \$200 tuition deposit (plus an additional \$200 housing deposit for resident students), nonrefundable, *must be submitted by January 15 to reserve space.*

If the applicant is accepted under the early decision plan but fails to submit the deposit by January 15, he will be reconsidered along with all other applicants, for regular admission, as described above.

TRANSFER STUDENTS

Transfer students from other institutions *must* submit application and required credentials prior to August 15 for the fall semester, December 15 for the spring semester, May 1 for the Summer Sessions.

The transfer student must be in good standing as to scholarship and conduct. He must be eligible to return to the last previously attended institution in the semester for which he seeks admission to this University.

An applicant who has attended one or more institutions of higher learning must request *each* registrar to mail directly to the Office of Admissions a transcript of his record, *even though credits were not earned.*

If an applicant has fewer than 60 semester hours of acceptable work (C or better on academic work from an accredited institution), he must request that his high school record and College Entrance Examination Board Test scores be sent to the Office of Admissions.

STUDENTS FROM FOREIGN INSTITUTIONS

Application, required records, and scores on the *Test of English as a Foreign Language* (see below) must be received from all *foreign applicants* no later than March 1 for the fall semester and November 1 for the spring semester.

REQUIRED RECORDS

Applicants must request all educational institutions attended to send directly to the Office of Admissions official credentials listing subjects studied, grades received, examinations taken, and degrees received. Certified copies of diplomas and certificates from secondary schools and all colleges and universities attended are required. Records of state examinations and certificates are also needed. All records become the property of the University and cannot be returned.

LANGUAGE TEST

Students whose native tongue is not English are required to take the *Test of English as a Foreign Language*. Students are responsible for making arrangements for taking the test and should address inquiries to: TOEFL, Educational Testing Service, Princeton, New Jersey 08540, U.S.A. The completed application form should be returned to the Testing Service at Princeton well in advance of the beginning of the semester for which the applicant seeks admission. A \$10 test fee, which should be remitted with the application, entitles the student to have his test score sent to three different institutions. Registration for the *Test of English as a Foreign Language* does not constitute application for admission to George Washington University.

The Bulletin of Information, obtainable without charge, contains a description of the test as well as rules regarding application, fees, reports, and the conduct of the test; lists of examination centers; examination dates; and application blank. On the application for the test, the student should specify that the scores be sent to the Office of Admissions, George Washington University, Washington, D.C. 20006.

If additional tests are prescribed, necessary instructions will be sent to the applicant by the Office of Admissions.

READMISSION

A student previously registered in the University who was not registered on campus during the immediately preceding semester must apply for readmission. Final dates for applying are the same as those for "Transfer Students," see page 15. If the student applies as a degree candidate and was previously registered as a nondegree student, or if he has attended one or more higher institutions during his absence from the University, he must have complete, official transcripts sent to the Office of Admissions from each institution attended before his application will be considered. Applications for readmission are considered on the basis of regulations currently effective.

The application fee is waived for a student applying for readmission who was registered as a degree candidate at the time of his last registration at this University and has not registered at another institution since his last registration at this University.

TUITION DEPOSIT

Upon notification of acceptance, a \$100 tuition deposit (\$200 for students admitted by early decision, see page 15) will be required of all full-time students including those readmitted. The deposit is credited toward tuition and is not refundable.

ADVISED PLACEMENT EXAMINATIONS

Credit may be granted for study at the college or approved secondary school, if substantiated by the appropriate Advised Placement Examination of the appropriate Board. Arrangement for the examination of the applicant and should be made with the Office of Examinations, Educational Testing Service, P.O. Box 60740 or 1947 Center Street, Berkeley, California. The applicant must request the examining service to refer to the Office of Admissions. Consideration is given to the performance on the examination and the quality of the work completed by the applicant. Credit may be granted for higher-level courses in the same field. Credit may be so granted as up to 30 semester hours, not more than 10 in any one subject.

Students who are admitted at the college level and who have completed work at the college level may be granted credit for the general University regulations. The work of low pass grade (D or below) will not be considered.

GENERAL CREDIT

Students of credit earned at the college level may be granted credit for the general University regulations. The work of low pass grade (D or below) will not be considered. The Office of Admissions will indicate which courses are eligible for credit. The Office of Admissions will indicate which courses are eligible for credit.

REGULATIONS

Students must follow the University regulations, on pages 64-66.

Students must not attend classes until registration is completed and the fee has been paid. Students must not attend classes until registration is completed and the fee has been paid. Students must not attend classes until registration is completed and the fee has been paid.

SCHOOL OF ENGINEERING AND ARCHITECTURE

TESTED RECORDS

...all educational institutions attended to ...
...official credentials listing subjects ...
...taken and degrees received. Certified copies of ...
...secondary schools and all colleges and universities ...
...Records of new examinations and certificates ...
...become the property of the University and ...

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...Language. Students are responsible for making ...
...test and should address inquiries to TOEFL ...

Testing Service, Princeton, New Jersey 08540, U.S.A. The ...
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...Washington, D.C. ...

...If additional ...
...by the Office ...

ADMISSION

...student previously registered ...
...during the immediate ...

...From data for applying are the same as ...
...page 15. If the student applies as a degree candidate ...

...as a two-degree student, or if he has attended one or more ...
...during his absence from the University, he must have ...

...transcripts sent to the Office of Admissions from each ...
...for his application will be considered. Applications for ...

...considered on the basis of regulations currently effective ...
...The application fee is waived for a student applying for ...

...was registered as a degree candidate at the last ...
...University and has not registered at another institution since ...
...of the University

FINANCIAL DEPOSIT

...Upon notification of acceptance, a \$100 tuition deposit (\$100 for students ...
...submitted by early decision, see page 15) will be required of all ...

ADVANCED STANDING

CREDIT FOR ADVANCED PLACEMENT EXAMINATIONS

Advanced standing may be granted for study at the collegiate level in advanced courses in an approved secondary school, if substantiated by satisfactory performance in the appropriate Advanced Placement Examination of the College Entrance Examination Board. Arrangement for the examination is the responsibility of the applicant and should be made with the College Board, Advanced Placement Examinations, Educational Testing Service, 20 Nassau Street, Princeton, N.J. 08540 or 1947 Center Street, Berkeley, Calif. 94707.

The applicant must request the examining service to submit the test papers and scores to the Office of Admissions. Consideration is given to both the quality of performance on the examination and the quality and content of the course of study completed by the applicant. Credit may be withheld pending satisfactory completion of higher-level courses in the same field.

Total credit that may be so granted is up to 30 semester hours, not more than 8 semester hours of which may be in any one examination area.

CREDIT FROM HIGHER INSTITUTIONS

Advanced standing may be granted for work successfully completed at accredited institutions of higher learning. Credit will be granted for transferred work only when it meets the requirements for the degree sought at this University, and subject to the general University regulations concerning satisfactory subsequent work. Work of low pass grade (*D* or the equivalent) will not be considered for transfer.

SERVICE SCHOOL CREDIT

A limited amount of credit earned in service schools since 1941 may be considered for assignment to qualified degree candidates in the School of Engineering and Applied Science. Veterans should submit to the Office of Admissions photostatic copies of their service school records, indicating courses successfully completed with sufficient identification of the course to locate it in the *Guide to Evaluation of Educational Experience in the Armed Forces*.

REGULATIONS

Regulations regarding REGISTRATION, FEES AND FINANCES are stated on pages 49-54; other University regulations, on pages 60-66.

ATTENDANCE

A student may not attend classes until registration is completed and fees due are paid. Regular attendance is required. A student may be dropped from any course for undue absence.

A student suspended for any cause may not attend classes during the period of suspension.

The student is expected to attend every meeting of the course in which he is registered, fully prepared to carry on the work required. The student is held

responsible for all work in the course, and all absences must be excused before provision will be made for him to make up the work missed. Excuses for absences from examinations which have been announced in advance can be obtained only by written application to the instructor in charge of the course.

ACADEMIC WORK LOAD

A full-time undergraduate student who is not on probation may register for no more than 20 semester hours. A student employed more than 24 hours a week who is not on probation may take no more than 10 semester hours. In exceptional cases these limits may be exceeded with the Dean's permission.

A student previously unemployed who accepts employment after registration must immediately report that fact to the Dean so that his schedule may be adjusted if necessary.

ADVISORY SYSTEM

The School of Engineering and Applied Science encourages a close faculty-student relationship. Every entering undergraduate student is assigned a permanent faculty adviser to assist him in orienting himself in the professional discipline. Faculty advisers counsel students on their programs of study, the achievement and maintenance of satisfactory scholastic performances, professional development, and extracurricular activity as part of the educational process. The adviser represents the student in all cases requiring faculty action.

Students must obtain their advisers' approval of programs of study prior to registration. Until a student has completed the work required for the degree he must consult his adviser in all academic matters. However, an adviser may not deny a student entry into any course or activity to which he is entitled under the regulations of the School.

All students are encouraged to discuss college problems with their advisers or instructors at any time; and parents or guardians are invited to consult with the Dean and advisers concerning any student problems.

Faculty advisers discharge their counseling duties in accordance with the high principles of their professional responsibility; however, the final responsibility for a student's action lies wholly with the student.

SCHOLARSHIP

For scholarship requirements for graduation, see "Graduation Requirements," page 22.

Grades.—Grades are mailed to the student through the Office of the Registrar at the close of each semester.

The following grading system is used: *A*, excellent; *B*, good; *C*, passing; *F*, failing; *CR*, credit. Whenever a grade has not been assigned, the symbol *I* (incomplete) or the symbol *W* (authorized withdrawal) is recorded.

An *I* (incomplete) grade is given by an instructor only for reasons satisfactory to the instructor and presented to him before the last day of classes for the semester in which the course is given. An *I* cannot be removed by repeating the course. An *I* cannot be made up after the lapse of one calendar year except by written permission of the Dean's Council. An *I* which is not removed within one calendar year is automatically changed to an *F*.

Mid-semester Warning.—At the end of the seventh week of each semester, instructors report to the Dean the names of students whose scholarship is un-

satisfactory. On receipt of a warning notice the student must consult his instructor and his adviser immediately.

The adviser may prescribe diagnostic tests and/or remedial study to be completed before the end of the current semester.

Probation.—A student who receives two grades or more of *F* in one semester will be placed on probation. This probation extends over the period in which the student completes a minimum of 12 semester hours of study and may be extended over a longer period. If a student earns a grade of *C* or better in all courses taken during the period of probation, he is removed from probational status. If he receives one grade of *F* while on probation, the probationary period is extended for a semester.

Upon being placed on probation, a student may elect to undertake the Engineering Student Probation Program of testing, counseling, and remedial work available at the Psychological Clinic. If this program is undertaken, the student is continued on probation until his scholastic deficiency is removed. However, students may be continued on probation in this program no longer than four semesters. At the end of this period, each student's case is reviewed in accordance with the general rules concerning probation and suspension.

A student on probation is required to follow a specified program of study, including remedial studies as prescribed, and is not eligible to participate in student activities.

Suspension.—If a student receives one or more grades of *F* in a second semester of probation, he will be suspended, unless he is participating in the Engineering Student Probation Program.

A student suspended for poor scholarship may apply to be readmitted in the semester or summer session which begins next after an interval of one calendar year. A student readmitted after suspension is on probation. In no case will the probationary period after readmission exceed 24 hours of study. A student suspended twice for poor scholarship will not be readmitted.

HONORS LIST

The Faculty of the School recognizes meritorious scholastic achievement by an Honors List, containing the names of candidates for undergraduate degrees whose scholastic achievement satisfies all of the following requirements:

1. The completion of a minimum of 13 semester hours in one semester, with the total number of hours in which the grade of *A* is earned being at least equal to the total in which the grade of *C* is earned.
2. No grade below *C* has been received during the qualifying period.
3. No disciplinary action has been taken in respect to the student.

The Honors List is prepared at the end of the fall and spring semesters and displayed in an appropriate public place in the School. A notation is made on the student's record each time his name is included in the List.

USE OF CORRECT ENGLISH

Any student whose written or spoken English in any course is unsatisfactory may be reported by the instructor to the Dean. The Dean may assign supplementary work, without academic credit, varying in amount with the needs of the student. If the work prescribed is equivalent to a course, the regular tuition fee is charged. The granting of a degree may be delayed for failure to make up any such deficiency in English to the satisfaction of the Dean.

GRADUATION REQUIREMENTS

See page 64 for general requirements for graduation.

RESIDENCE

A minimum of 30 weeks and 30 semester hours must be completed in residence. Summer work may be counted. Unless special permission is granted by the Dean to study elsewhere, the work of the final year must be completed in residence.

QUALITY-POINT INDEX

The quality-point index, which is computed to determine scholastic eligibility for graduation (see below), is obtained by dividing the number of quality points by the number of semester hours for which the student has registered.

Quality points are computed from grades as follows: *A*, four points; *B*, three points; *C*, two points; *F*, no points, for each semester hour for which the student has registered. Courses marked *W*, *I*, or *CR* are not considered in determining the index, except that courses marked *I* will be considered when a formal grade is recorded. Grades in courses taken at another institution are not considered in computing the quality-point index.

SCHOLARSHIP

Through February, 1971.—To be eligible for graduation a student must have a quality-point index of at least 2.0 in all work taken at this University and accepted in the School of Engineering and Applied Science.

June, 1971, and thereafter.—Beginning June 1, 1971, to be eligible for graduation a student must have a quality-point index of at least 2.2 in those technical courses specified in the fifth through the eighth semester of his curriculum.

HONORS

With Distinction.—A Bachelor's degree may be conferred "With Distinction," at the discretion of the Faculty, if a student attains a quality-point index of 3.50 or higher on all work taken at this institution. To be eligible for this honor a student must have completed at this institution at least one-half of the work required for the degree.

Special Honors.—A Bachelor's degree may be conferred with "Special Honors," at the discretion of the Faculty, for outstanding achievement in the student's senior year work on recommendation of the Faculty, under the following regulations:

1. The student must have his candidacy for Special Honors approved by the department chairman representing his major field not later than the beginning of his senior year.
2. The student must meet such other conditions as may be set at the time his candidacy is approved.
3. No student will be awarded Special Honors unless he has a quality-point index of at least 3.00 on all work taken at this institution.
4. To be eligible for Special Honors a student must have completed at this institution at least one-half of the work required for the degree.

THE CURRICULA

The four four-year curricula lead to the degree of Bachelor of Science, with parenthetical designation of the major; for example, Bachelor of Science (Electrical Engineering). Students who are deficient in preparation require a longer period; those who are admitted with advanced standing or who attend summer sessions can complete the requirements in less time.

The program of the first four semesters (2 years) is common to all curricula and provides the essential broad base of scientific principles and mathematical techniques necessary for the professional courses of the last four semesters, together with an appropriate background in the humanities and social sciences (see below).

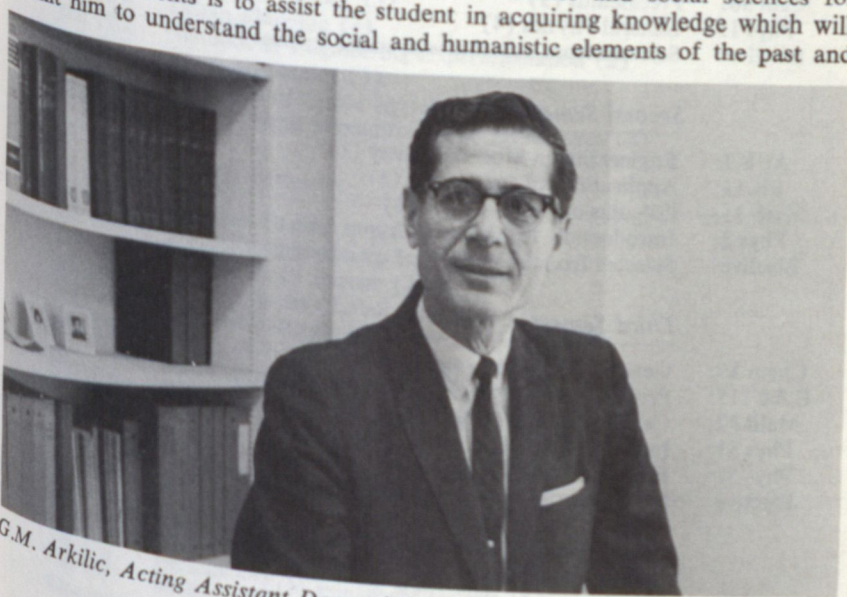
A minimum total of 130 semester hours is required to qualify for the degree. However, students are encouraged to elect additional course work above the required minimum to the extent that their interests and the School's offerings permit.

Degrees are offered in Civil Engineering, Electrical Engineering, Measurement Science, and Mechanical Engineering. Students in Electrical Engineering may select an area of concentration in Computer Science.

The student is assisted by his faculty adviser, who approves his program each semester prior to registration. For the guidance of the student and his adviser, every beginning student takes the School's placement examinations in Algebra and Trigonometry and, if deficient in either of these areas, must take remedial work in the area of deficiency.

COURSES IN THE HUMANITIES AND SOCIAL SCIENCES

The basic purpose of a program in the humanities and social sciences for engineering students is to assist the student in acquiring knowledge which will permit him to understand the social and humanistic elements of the past and



G.M. Arkilic, Acting Assistant Dean of the School of Engineering and Applied Science

present and to analyze the problems facing his society today. The ultimate goal is to help the engineer have a better understanding of his society and an appreciation of his role and responsibilities within it.

Since the education of an engineering student is, by necessity, oriented toward technical subjects, his program in the humanities and social sciences should not emphasize technical aspects and skills, but should rather consist of courses which can broaden his outlook and motivation toward sociological and humanistic sensitivities. As a consequence, courses in subjects such as accounting, finance, industrial management, introductory languages, and personnel administration should not be included in the humanities and social sciences program. On the other hand, courses in areas such as anthropology, economics, fine arts, geography, history, literature, philosophy, political science, psychology, and sociology are considered appropriate.

Each engineering student is required to prepare, with the assistance of his faculty adviser, a program of courses in the humanities and social sciences, explaining how his program meets the purpose stated above. The student's program must include a minimum of 18 semester hours and must be approved by both his adviser and department chairman.

CORE CURRICULUM—FIRST FOUR SEMESTERS

The core curriculum, the first four semesters, is common to all the majors in the School. Semester hours are indicated in parentheses after the title of each course.

First Semester

Ap S 1:	Engineering in Modern Society (1)
Engl 1 or 1x:	English Composition (3)
Math 30:	Precalculus (3)
Phys 1:	General Physics (4)
Elective:	Selected from humanities or social sciences (3)

Second Semester

Ap S 2:	Engineering in Modern Society (1)
EE 51:	Applications of Computers (3)
Math 31:	Calculus of One Variable (3)
Phys 2:	Introduction to Modern Physics (4)
Elective:	Selected from humanities or social sciences (3)

Third Semester

Chem 13:	General Chemistry (4)
E Ad 115:	Probabilistic and Statistical Methods in Engineering (3)
Math 32:	Calculus of Several Variables (3)
Phys 31:	Introduction to Theoretical Physics (2)
Phys 51:	Introduction to Experimental Physics (2)
Elective:	Selected from humanities or social sciences (3)

Fourth Semester

Ap S 59:	Introductory Analytical Mechanics (4)
Ap S 113:	Engineering Analysis I (3)

- CE 140: Materials Science (3)
 Phys 32: Introduction to Theoretical Physics (2)
 Phys 52: Introduction to Experimental Physics (2)
 Elective: Selected from humanities or social sciences (3)

CIVIL ENGINEERING

Civil Engineering is the broad branch of engineering most closely related to daily human activities. Study in this area prepares for careers in the design of buildings, bridges, aircraft and missile frames, tunnels, and dams; the planning of cities; and research on new types of structures, new materials, and new methods of construction.

The concentration of study outlined below provides the essentials for beginning a career upon graduation, for registration as a professional civil engineer as required by law, and for continuing study at the graduate level.

First Four Semesters

See Core Curriculum (pages 24-25)

Fifth Semester

- Ap S 114: Engineering Analysis II (3)
 CE 120: Introduction to the Mechanics of Solids (4)
 CE 121: Structural Theory (3)
 ME 131: Thermodynamics (3)
 Elective: Selected from humanities or social sciences (3)

Sixth Semester

- CE 122: Structural Theory (3)
 CE 183: Urban Planning (3)
 ME 120: Methods of Engineering Experimentation (2)
 ME 126: Fluid Mechanics (3)
 ME 134: Dynamics of Linear Systems (3)
 Elective: Selected from humanities or social sciences (3)

Seventh Semester

- CE 166: Materials Engineering (2)
 CE 167: Materials Engineering Laboratory (1)
 CE 181: Applied Earth Science (2)
 CE 185: Soil Engineering Laboratory (1)
 CE 191: Structural Design (3)
 CE 193: Design of Hydraulic Structures (3)
 CE 195: Urban Transportation Engineering (3)
 Elective: Technical elective (3)

Eighth Semester

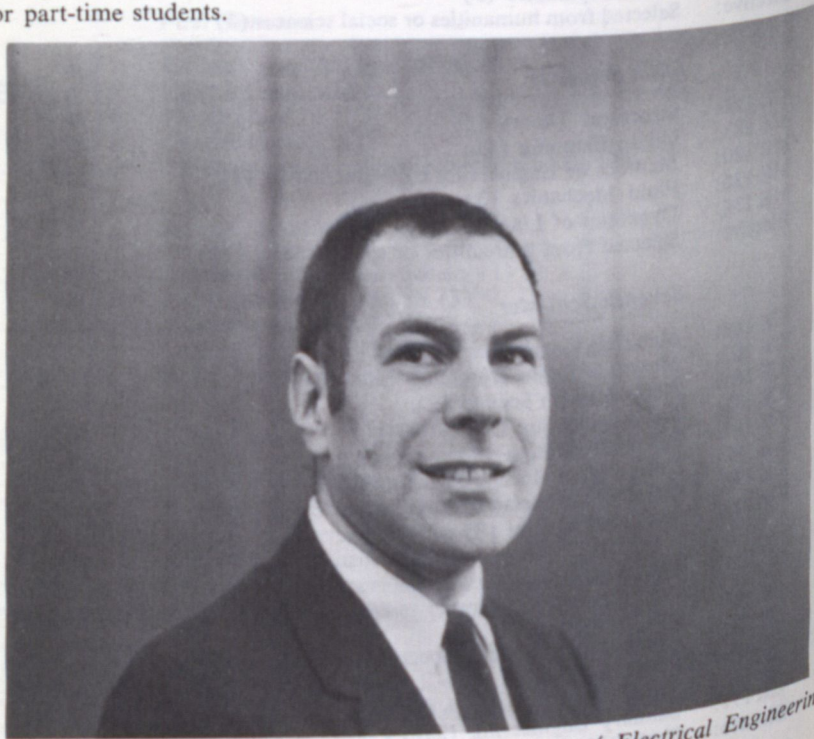
- CE 168: Soil Mechanics (3)
 CE 190: Legal and Economic Aspects of Engineering (2)
 CE 192: Structural Design (3)
 CE 196: Introductory Structural Reliability (3)
 CE 197: Sanitary Engineering (3)
 Elective: Technical elective (3)

ELECTRICAL ENGINEERING

Electrical engineering is a branch of engineering in which practical as well as theoretical and scientific aspects are integrated to provide a well-balanced discipline. Basic sciences such as physics and mathematics form the roots on which electrical engineering builds to create a truly applied science and to develop the techniques necessary to solve problems. Analysis, synthesis, and design go hand in hand. The electrical engineering curriculum is designed to provide the student with such an integrated approach. The first two years of the core curriculum are devoted to developing a sound foundation of basic sciences coupled with engineering sciences. The third year continues with engineering sciences and starts going deeper into electrical engineering. The fourth year is totally devoted to electrical engineering. At the fourth year the student has a choice of either following the regular electrical engineering curriculum or branching off into an area of concentration in computer science.

The Department of Electrical Engineering has recently acquired modern laboratory equipment, including its own computer. The student has an opportunity during his last year to work on individual projects where his ingenuity, coupled with faculty advice and guidance, permits him to concentrate in areas such as computers, communications, microwaves, control, electronics, medical engineering, circuits, and others.

The scheduling of courses has been arranged to accommodate both the full-time and the part-time student. Undergraduate courses are offered once a year during the day for full-time students, and once every two years in the evening for part-time students.



A.C. Meltzer, Acting Chairman of the Department of Electrical Engineering

The curriculum prepares the student either for entering graduate school immediately upon graduation, or for a career in electrical engineering and possible graduate studies later. Graduates usually go on to research, design, development, sales, technical management, production, or graduate studies, as well as to teaching.

First Four Semesters

See Core Curriculum (pages 24-25)

Fifth Semester

- Ap S 114: Engineering Analysis II (3)
 EE 11: Linear Networks I (3)
 EE 31: Fields and Waves I (3)
 EE 60: Introductory Electrical Engineering Laboratory I (2)
 ME 131: Thermodynamics (3)
 Elective: Selected from humanities or social sciences (3)

Sixth Semester

- EE 12: Linear Networks II (3)
 EE 20: Introductory Engineering Electronics (3)
 EE 32: Fields and Waves II (3)
 EE 61: Introductory Electrical Engineering Laboratory II (2)
 EE 152: Introduction to Digital Computers (3)
 Elective: Selected from humanities or social sciences (3)

Seventh Semester

- EE 113: Network Analysis and Design (3)
 EE 121: Engineering Electronics and Design (3)
 EE 133: Electromagnetic Waves (3)
 EE 143: Elements of Communication Engineering I (3)
 EE 161: Electrical Engineering Laboratory (2)
 EE 177: Electrical Energy Conversion (3)
 or EE 184: Introduction to Medical Engineering (3)

Eighth Semester

- EE 114: Linear Active Networks (3)
 EE 122: Pulse and Waveshaping Electronic Design (3)
 EE 144: Elements of Communication Engineering II (3)
 EE 160: Electrical Measurements (3)
 EE 162: Electrical Engineering Laboratory (2)
 EE 172: Control Systems (3)

Computer Science

Computer science is a new and developing discipline which combines the electronic design and mathematical utilization of computers into a single comprehensive area. The student who completes this option will be able to design both the hardware and software needed for large-scale computing systems. The curriculum prepares the student for graduate school or for a career in computing design and applications.

First Four Semesters

See Core Curriculum (pages 24–25)

Fifth Semester

- Ap S 114: Engineering Analysis II (3)
EE 11: Linear Networks I (3)
EE 31: Fields and Waves I (3)
EE 60: Introductory Electrical Engineering Laboratory I (2)
ME 131: Thermodynamics (3)
Elective: Selected from humanities or social sciences (3)

Sixth Semester

- EE 12: Linear Networks II (3)
EE 20: Introductory Engineering Electronics (3)
EE 32: Fields and Waves II (3)
EE 61: Introductory Electrical Engineering Laboratory II (2)
EE 152: Introduction to Digital Computers (3)
Elective: Selected from humanities or social sciences (3)

Seventh Semester

- EE 113: Network Analysis and Design (3)
EE 121: Engineering Electronics and Design (3)
EE 153: Design of Switching Systems (3)
EE 155: Introduction to Numerical Methods (3)
EE 157: Machine and Assembly Language Programming (3)
EE 161: Electrical Engineering Laboratory (2)

Eighth Semester

- EE 122: Pulse and Waveshaping Electronic Design (3)
EE 154: Digital Computer Design (3)
EE 156: Introduction to System Programming (3)
EE 158: Algorithmic Methods and High-level Languages (3)
EE 162: Electrical Engineering Laboratory (2)
EE 172: Control Systems (3)

MEASUREMENT SCIENCE

Measurement science concerns the design, construction, and use of instruments in measurement, and the design of experiments. The curriculum prepares for such activities as testing of rockets, missiles, and space vehicles; measurements of the characteristics and properties of materials; determination of standards of measurement in light, heat, optics, electricity, etc.; measurement in various fields of science and in medicine; design and construction of measuring instruments; design and execution of experiments and tests of various kinds; and control of quality of manufactured products.

The graduate will find many opportunities in space research, industry, manufacturing, and research. Opportunities are especially good in the design and application of instruments.

First Four Semesters

See Core Curriculum (pages 24–25)

Fifth Semester

- Ap S 114: Engineering Analysis II (3)
 EE 11: Linear Networks I (3)
 EE 31: Fields and Waves I (3)
 EE 60: Introductory Electrical Engineering Laboratory I (2)
 ME 131: Thermodynamics (3)
 Elective: Selected from humanities or social sciences (3)

Sixth Semester

- EE 12: Linear Networks II (3)
 EE 20: Introductory Engineering Electronics (3)
 EE 61: Introductory Electrical Engineering Laboratory II (2)
 EE 152: Introduction to Digital Computers (3)
 ME 126: Fluid Mechanics (3)
 Elective: Selected from humanities or social sciences (3)

Seventh Semester

- EE 121: Engineering Electronics and Design (3)
 MeaS 101: Measurement Science (3)
 MeaS 111: Introductory Instrumentation (3)
 MeaS 121: Mechanical Measurement (3)
 MeaS 122: Heat Measurement (3)
 MeaS 131: Measurement Laboratory (3)

Eighth Semester

- EE 122: Pulse and Waveshaping Electronic Design (3)
 EE 160: Electrical Measurements (3)
 MeaS 102: Measurement Science (3)
 MeaS 112: Instrumentation (3)
 MeaS 123: Pressure Measurement (3)
 MeaS 132: Measurement Projects Laboratory (3)

MECHANICAL ENGINEERING

Mechanical engineering has become increasingly comprehensive in the range of its activities. The mechanical engineering curriculum provides a background for careers in research, design, development, and manufacturing in a wide variety of industries. The mechanical engineer is concerned with the behavior and processing of materials; the analysis and design of energy systems; the physical behavior and use of fluids; and the construction of mechanical systems—mechanisms, machines, control systems, power devices.

Course offerings in the field of mechanical engineering (beyond those in the Core Curriculum) are divided into three major groups: mechanics and materials, thermal and fluid sciences, mechanical systems and design. The program of study outlined below is based on the concept that the mechanical engineer must be prepared to meet the challenge of ever-increasing technical and economic problems.

The four-year undergraduate curriculum has been designated to provide a fairly comprehensive basic mechanical engineering education. The preparation is adequate for beginning the practice of mechanical engineering upon gradu-

ation, and provides the essential knowledge for registration as required by law for practice as a professional mechanical engineer.

The program also serves as preparation for graduate study in any specialized fields of mechanical engineering.



Alfred Freudenthal, Acting Chairman of the Department of Engineering Mechanics

First Four Semesters

See Core Curriculum (pages 24-25)

Fifth Semester

- Ap S 114: Engineering Analysis II (3)
- CE 120: Introduction to the Mechanics of Solids (4)
- EE 11: Linear Networks I (3)
- ME 131: Thermodynamics (3)
- Elective: Selected from humanities or social sciences (3)

Sixth Semester

- EE 20: Introductory Engineering Electronics (3)
- ME 120: Methods of Engineering Experimentation (2)
- ME 126: Fluid Mechanics (3)
- ME 134: Dynamics of Linear Systems (3)
- ME 148: Thermodynamic Analysis (3)
- Elective: Selected from humanities or social sciences (3)

Seventh Semester

-
- CE 166: Materials Engineering (2)
 CE 167: Materials Engineering Laboratory (1)
 ME 155: Compressible Fluid Flow (3)
 ME 161: Advanced Dynamics (3)
 or
 Technical elective (3)
 ME 171: Mechanics of Deformable Solids I (3)
 ME 187: Heat Transfer Theory (3)
 ME 191: Mechanical Design (3)

Eighth Semester

-
- EE 172: Control Systems (3)
 ME 152: Mechanical Engineering Laboratory (2)
 ME 180: Propulsion (3)
 ME 193: Engineering Systems Design (3)
 ME 194: Energy Conversion (3)
 Elective: Technical elective (3)

Graduate Study

THE SCHOOL OF ENGINEERING AND APPLIED SCIENCE offers graduate study leading to the degrees of Master of Science, Master of Engineering Administration, and Doctor of Science.

In its graduate programs, the School, as it does in undergraduate study, adheres to the educational philosophy of increasing the knowledge and understanding of the individual student by concentration on principles and their application rather than by encyclopedic coverage of techniques and specialized detail. Each program is individually planned according to the student's preparation and needs.

Graduate study may be undertaken in any field of engineering or applied science in which the School has adequate facilities and resources. Upon approval, the student may select courses in other departments of instruction in the University in order to serve specific needs or objectives.

THE MASTER'S PROGRAMS

The student's program may provide for broad coverage in a variety of fields or may be designed to provide a concentration in particular areas. The minimum program consists of 24 semester hours of approved graduate courses in the major field and area of concentration, a Master's thesis (equivalent to 6 semester hours), and a Master's Comprehensive Examination. Students whose undergraduate study does not include necessary prerequisites may be required to take more than 30 semester hours.

Upon admission the student is assigned an adviser. Programs of study are determined by any prerequisites established and the requirements of the department in which the student wishes to study. The program of studies in preparation

tion for the Master's Comprehensive Examination must be approved by the student's adviser and the appropriate department chairman.

ADMISSION

Admission to graduate study toward a Master's degree requires an appropriate Bachelor's degree from a recognized institution and evidence of capacity for productive work in the field selected, as indicated by undergraduate grades, Graduate Record Examination scores, and similar data.

An applicant who has significant deficiencies in preparation may be required to take prescribed undergraduate courses as an unclassified student before being admitted to graduate student status. In some cases, if such deficiencies are minimal, he may be admitted to graduate student status and allowed to take a limited number of graduate courses while completing the undergraduate courses in which he is deficient. In no case may the undergraduate courses thus taken fulfill any part of the requirements for the Master's degree.

For additional admissions requirements for the degree of Master of Engineering Administration, see page 39, for the degree of Master of Science in the field of Operations Research, see page 37. Candidates for the degree of Master of Science in the field of Electrical Engineering must have satisfied specific undergraduate requirements, depending upon the area of concentration. Students should consult the special brochure *The Graduate Programs of the Department of Electrical Engineering*.

ADMISSION PROCEDURE

Forms for application for admission are available at the School of Engineering and Applied Science. They must be submitted, together with the application fee of \$25, to the Director of Engineering Admissions, Room 100, Tompkins Hall of Engineering, George Washington University, Washington, D.C. 20006, no later than September 1 for the fall semester, December 15 for the spring semester, May 1 for the first summer session, and June 1 for the second summer session. The applicant must request each educational institution attended since high school graduation to send an official transcript of his record directly to the Director of Engineering Admissions. If the applicant has completed the Graduate Record Examination, he should request that his scores be sent to the School. The applicant will be notified by mail when a decision on his admission has been made. Foreign students are required to take the *Test of English as a Foreign Language* (see page 16).

All inquiries and correspondence relative to graduate admission should be directed to the Director of Engineering Admissions.

TRANSFER CREDIT

Up to 6 semester hours of satisfactory credit (with grades of A or B), which normally must have been earned in a graduate program at another recognized institution, may be accepted in transfer, when applicable, to satisfy Master's degree requirements in this School. However, the student must, with the approval of his adviser, petition to the appropriate department chairman for such a transfer.

REGISTRATION

A graduate student may register for classes when he presents an official letter of admission or his student identification card from the previous semester. No registration is accepted for less than a semester or one summer session.

Concurrent registration in this School and in another institution not a member of the Consortium of Universities of the Washington Metropolitan Area, Inc., or another division of this University requires the written permission of the Deans concerned, *prior to registration*. Allowance of credit for work done concurrently at another institution is at the discretion of the Dean.

Dates and hours of registration are stated in the Calendar, page 4, and in the *Schedule of Classes* published in advance of each semester.

MASTER'S THESIS

The degree candidate must submit an acceptable thesis to demonstrate his ability to make independent use of the knowledge and discipline of thought acquired and developed by graduate study, to furnish objective evidence of constructive power in a given field, and to demonstrate that he can communicate the results of his work in writing. Work of a suitable character for which the student has professional responsibility may be considered, whether done on or off campus, provided no significant amount of work is completed without faculty supervision.

As a part of registration for the thesis course 299, the candidate must submit to the appropriate department chairman (on the form obtainable at the School office) his thesis area, approved by his faculty adviser. He must submit his thesis title to the Dean, on the form available in the School office, at the beginning of the semester in which he expects to graduate. Registration in thesis 299-300 entitles the student, during such registration, to the advice of the member of the faculty under whom the thesis is to be written. He may consult his adviser, but the thesis is the exclusive responsibility of the student.

The thesis in final form must be submitted to the appropriate department chairman by the date stated in the calendar for the semester in which the candidate enrolls in thesis 300. In case a thesis is unfinished on the date specified, the student will be granted an additional semester and must pay the "Continuous Registration" fee (see page 52) unless he is registered for course work. If the preparation of the thesis extends beyond the three semesters, approval for an extension of time will be required and the student must reregister for thesis 300 and pay tuition as for a repeated course. The overall time limit for earning the degree (see page 35) may not be exceeded.

A thesis may be submitted in final form one time. The acceptability of the thesis is determined exclusively by the Master's Comprehensive Examination committee. If the thesis is unacceptable, the student's graduate status is terminated.

Printed copies of detailed regulations regarding the form and reproduction of the thesis are available in the Office of the School. Accepted theses, with accompanying drawings, become the property of the University and are deposited in the University Library and the School's Library, where the duplicate copies are bound and made available for circulation. Permission to publish or adapt material in them must be secured from the Dean.

MASTER'S COMPREHENSIVE EXAMINATION

After completing his prescribed program and submitting his thesis, the candidate must pass a Master's Comprehensive Examination, to demonstrate substantial understanding of principles and method and their use in the area of his interest. This Examination may be written, oral, or both. A graduate student who fails any portion of the Master's Comprehensive Examination on his first attempt may be examined one more time if approval is given by the appropriate Examining Committee. In the event of failure to complete the Examination satisfactorily, the student's graduate status terminates.

REGULATIONS

Regulations regarding REGISTRATION, FEES AND FINANCES are stated on pages 49-54; other University regulations, on pages 60-66.

ATTENDANCE

The student is expected to attend every meeting of the course in which he is registered, fully prepared to carry on the work required. A student may be dropped from any course for undue absence. Excused absences must be arranged with the instructor.

SCHOLARSHIP

Grades are indicated as *A*, excellent; *B*, good; *C*, minimum pass; *F*, fail; and *CR*, credit for satisfactory thesis completion. Whenever a grade is not assigned, the symbol *I* (incomplete) or the symbol *W* (authorized withdrawal) is recorded.

An incomplete may be given at the instructor's discretion. The instructor must state in writing the conditions to be satisfied and the time allowed for making up the incomplete. An incomplete which is not removed within one calendar year is automatically changed to an *F*.

A student may not repeat for credit a course in which he has received a grade of *C* or above, unless required to do so by the department concerned. A written statement requiring the student to repeat such a course for credit must be submitted to the Registrar by the appropriate department chairman.

For Master's work, a minimum of 24 semester hours of graduate course work with the grade of *B* or higher is required for graduation. Students who receive two grades of *F*, or (except those registered prior to and in continuous residence since the 1967 fall semester) three grades below *B*, are barred from further enrollment in graduate courses and, ordinarily, will not be readmitted to graduate study. Students who receive the grade of *C* in one or two courses are required to take additional course work to make up the minimum 24 semester hours of work with grades of *B* (except those registered prior to and in continuous residence since the 1967 fall semester).

RESIDENCE

In general, a minimum of one year of full-time study, or the equivalent in part-time study, must be completed in the School.

TIME TO COMPLETE MASTER'S DEGREE REQUIREMENTS

A full-time Master's candidate is allowed a maximum of three calendar years to complete all degree requirements, from the date of his first graduate-student status registration in prerequisite or graduate courses. A part-time Master's candidate is allowed a maximum of five calendar years. The time limit does not include any period of registration as an unclassified student before admission to graduate student status, nor does it encompass any specified period spent on approved leave of absence. Readmission is required upon expiration of leave of absence under the conditions and requirements then prevailing.

Students who do not complete degree requirements within the allowed time have their graduate status terminated. They may be readmitted to graduate status under conditions specified by the department chairman and approved by the Dean.

THE DEGREE OF MASTER OF SCIENCE

Electrical Engineering

Electrical engineering, at the graduate level, provides one of the most stimulating experiences in advanced studies. The student has reached a degree of maturity and basic knowledge that allows him to enter into new avenues of exciting work. Courses prepare the student in areas of concentration such as networks, electronics, fields and waves, communications, computer sciences, controls and systems, and medical engineering. Depending upon the interest of the student, some of the programs leading to the degree of Master of Science are given at the NASA-Langley Research Center, Langley Station, Hampton, Virginia. NASA-Langley's extensive scientific and engineering facilities and equipment are utilized whenever feasible.

The graduate programs are formulated to take into consideration the student's individual strengths, potentials, skills, aspirations, and abilities. They are determined, through consultation, by the student and his faculty adviser. Their purpose is to provide the student with a thorough understanding of his area of concentration and at the same time to provide him with the breadth of knowledge necessary in modern engineering.

The graduate programs are, in addition, designed to provide a needed educational service to the Washington technical community. Many of the courses have been developed after consultation with private industry and government agencies of the area. They are offered during both the afternoon and evening with a principle of rotation from year to year.

The Department of Electrical Engineering has continuously kept the graduate program up to date, through constant contact with recent developments, through its own research, and through the addition of several experts in appropriate fields serving as part-time and adjunct faculty. The Department provides a well-balanced, modern graduate program.

In order to provide the student with detailed information about its graduate programs, from the point of view of procedures, requirements, regulations, and scope, the Department of Electrical Engineering publishes annually a detailed brochure to supplement the present catalogue. In addition, the Department publishes special pamphlets describing specific programs.

Engineering Mechanics

Dynamic developments in science and technology during the past two decades and, most likely, in decades to come, will require that the engineer keep pace with newly emerging technological disciplines, as well as with new techniques in analysis, design, and computation. Under these circumstances, it is evident that graduate education in advanced technology will assume a vital, if not an absolutely indispensable, responsibility in answering the needs of a technologically oriented society and world. Amidst this proliferation of knowledge and technological specialty, the School adheres to the principle that versatility and depth in scientific fundamentals should be the characteristic features of any graduate program of study that attempts to prepare the graduate student to cope with the engineering developments of today and of the future.

The graduate program in the Department of Engineering Mechanics is quite diverse, encompassing the broad areas of solid mechanics, structural engineering, soil mechanics and foundation engineering, and the thermal and material sciences, as well as fluid mechanics and aerospace engineering. Within these broad categories are programs of study and research in the elasticity, inelasticity, and fracture of solids; the mechanics of continua; the theory of dislocations; the structure and properties of materials; the theory of plates, shells, and elastic stability; vibrations; advanced structural analysis and design, including structural reliability; nonlinear structural behavior and dynamic loading of structures; soil mechanics; classical and statistical thermodynamics; heat and mass transfer; energy conversion; combustion processes; incompressible, compressible, laminar viscous, and hypersonic flows; gas dynamics and reaction kinetics; analytical and nonlinear mechanics; advanced dynamics; space flight and celestial mechanics; dynamic stability of flight structures; propulsion systems; and aerothermochemistry. Depending upon the interest of the student, some of the programs leading to the degree of Master of Science are given at the NASA-Langley Research Center, Langley Station, Hampton, Virginia. NASA-Langley's extensive scientific and engineering facilities and equipment are utilized whenever feasible.

Programs of study are flexible and can be interdisciplinary in nature with provision for collateral study in related areas offered by other departments of the School and the University. Each program is arranged to fit the individual needs and interests of the graduate student, and at the same time to utilize effectively his previous experience and background. This background should normally include an undergraduate degree in engineering, the physical sciences, or applied mathematics. Each graduate student is assigned a faculty adviser on the basis of his study interests, thereby enabling a close student-faculty relationship to develop during the course of his program.

Operations Research

The program in Operations Research leading to the degree of Master of Science is administered by the Department of Engineering Administration.

The objective of the program in Operations Research is to prepare students whose undergraduate background training was in engineering, mathematics, or physical sciences for study in depth of analytically-oriented techniques of management decision-making and applications.

Expanded scientific, statistical, and mathematical knowledge, combined with growing needs in technical as well as social areas, have created increased demands for individuals trained in the discipline of operations analysis.

The discipline of operations research uses scientific principles supported by statistical and mathematical methodology to study the function and structure of complex technical industrial, military, and social systems in an effort to evaluate the probable effects of proposed courses of action, to establish criteria to judge the effectiveness of these courses, and to assist managers in making decisions to maximize financial return or minimize costs. The program in operations research provides a scientific basis for solving problems involving the interaction of many factors, organizational components in the interests of the whole or total problem. This breadth of interest is an example of the "systems approach" in the sense that a system is an interconnected complex of functionally related components. Most operations research problems begin with aspects of the general problem, with parts of restricted scope. This does not mean that operations research is not concerned with the system as a whole. Just as the industrial, mechanical, electrical, or chemical engineer may start with the study of subsystems or components of a general problem, so does the operations researcher.

ADMISSION TO OPERATIONS RESEARCH PROGRAM

In addition to the requirements for admission to graduate study (see page 32), the applicant must have an adequate knowledge of statistics. This requirement can be met by satisfactory completion of the following undergraduate courses or approved equivalents: Engineering Administration 115, *Probabilistic and Statistical Methods in Engineering*; and Statistics 189-90, *Mathematical Probability and Applications*. A student is required to earn the grade of C or better (unless the requirement is stipulated to be a grade of B or better upon his admission) in each undergraduate prerequisite course. If this scholarship requirement is not met, the student is barred from further enrollment. A student is not permitted to repeat any of the undergraduate prerequisite courses. Credit for prerequisite courses is not applicable toward the degree of Master of Science in the field of Operations Research.

REQUIRED COURSES

Required courses for the degree of Master of Science in the field of Operations Research are Engineering Administration 269, 270, 272, 273, and 299-300. Students must complete Engineering Administration 269, 270, and 273 before attempting any other courses; however, in certain cases, permission may be granted for concurrent registration. Students normally register for and complete Engineering Administration 272 in the last semester of the program.

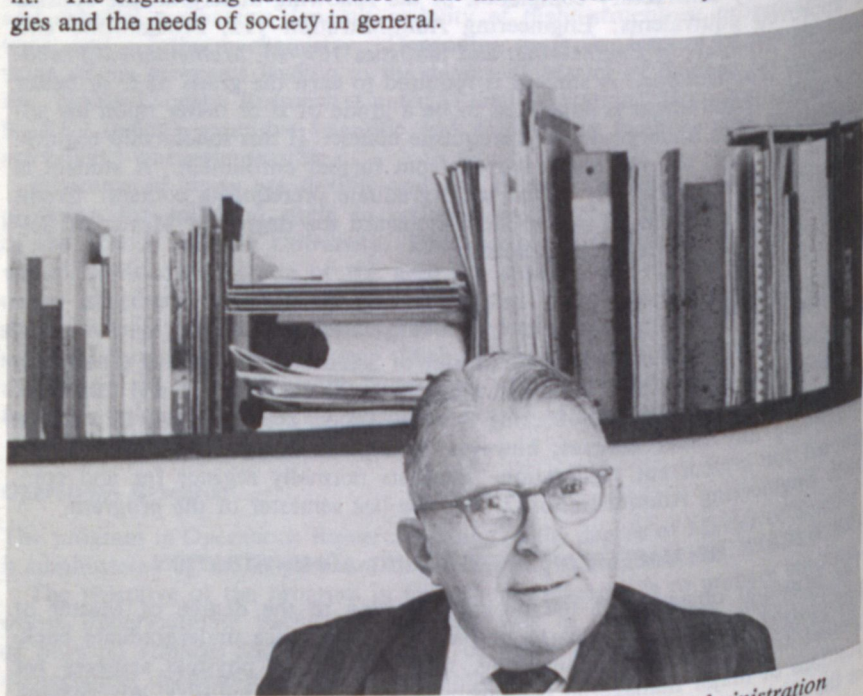
THE DEGREE OF MASTER OF ENGINEERING ADMINISTRATION

The principal objective of the program leading to the degree of Master of Engineering Administration is to prepare students whose undergraduate background training was in engineering, mathematics, or physical sciences for positions of major managerial responsibility in American industry, government, or the armed services.

The program is designed to help the student achieve a broad understanding of the administrative process. Although years of experience are required to develop the skills, insight, and maturity of judgment which distinguish an effective manager in technical and scientific enterprises, a graduate professional management curriculum can give the student an effective start as a manager. The curriculum provides an opportunity for the student to gain an understanding and to develop some useful managerial skills in the functional areas of engineering administration. One of the major purposes is to assist the student in forming the habit of examining problems from an over-all administrative point of view. The individual's own particular experience, and the explicit process of relating this experience to the theoretical structure which he starts to build in graduate study, provides each student with a personal frame of reference through which he may interpret management in a rapidly changing world.

Successful education for engineering administration implies a clear statement of what it is that an engineering manager must do, an analysis of the broad functions involved in management, and a final detailing of modern quantitative methods useful in making and executing decisions. It is the aim of the School, therefore, to keep alive a spirit of general inquiry and a problem-solving orientation.

The management of technical enterprise is probably the most difficult challenge of our times. The professional engineering manager today must understand not only the currently developing technologies but also the rapidly changing market place where these technologies are applied for society's benefit. The engineering administrator is the link between these dynamic technologies and the needs of society in general.



H.E. Smith, Chairman of the Department of Engineering Administration

In summary, the program of study has for its objective an educational experience which will contribute to the development of managers possessing a combination of technical know-how and administrative skill.

ADMISSION TO ENGINEERING ADMINISTRATION

In addition to the requirements for admission to graduate study (see page 32), the applicant must have an adequate knowledge of the principles of human relations, the fundamentals of accounting, and the fundamentals of statistics. This requirement can be met by satisfactory completion of the following undergraduate courses or approved equivalents: Accounting 115, *Survey of Accounting*; Engineering Administration 115, *Probabilistic and Statistical Methods in Engineering*; and Psychology 145, *Psychology of Management*. A student is required to earn the grade of C or better (unless the requirement is stipulated to be a grade of B or better upon his admission) in each undergraduate prerequisite course. If this scholarship requirement is not met the student is barred from further enrollment. A student is not permitted to repeat any of the undergraduate prerequisite courses. Credit for prerequisite courses is not applicable toward the degree of Master of Engineering Administration.

REQUIRED COURSES

Analysis, case study, and quantitative approaches are emphasized in addition to technical theories of administration. A program of study consisting of an integrated sequence of courses is prescribed for each student in conference with an adviser. Students are required to complete Engineering Administration 211-12, 269, 270, and 299-300; the remainder of the program is elective. Engineering Administration 211-12, 269, and 270 must be taken prior to the elective courses, except that in certain cases permission may be obtained for concurrent registration. Students who wish to take courses in operations research beyond Engineering Administration 269 and 270 should take Engineering Administration 273 prior to or concurrently with other operations research courses.

THE DOCTORAL PROGRAM

The School of Engineering and Applied Science offers a program of advanced study and research leading to the degree of Doctor of Science. This program is limited to recognized fields in engineering or applied science in which a scientific discipline exists and for which the University has adequate resources.

The Doctoral discipline is designed to prepare the student for a career of creative scholarship by providing a broad background of knowledge and an understanding of research methods. It requires study of interrelated fields of learning as well as original research in the field of central interest.

The discipline for the degree is divided into two stages. The first—made up of a study of interrelated fields of learning which support the general area of research concentration—culminates in the qualifying examination. The second—composed of research investigation of a particular subject in a special field and the presentation of such research findings in a written dissertation—culminates in the final examination.

ADMISSION TO DOCTORAL STUDY

The applicant must have adequate preparation for advanced study, including a satisfactory Master's degree, or the equivalent, together with acceptable personal qualities and a capacity for creative scholarship. He must have capabilities and interests beyond the mere assimilation of organized materials in formal courses of instruction. Originality of mind combined with balanced judgment and accuracy in observation or experiment are necessary to the successful applicant.

APPLICATION FOR ADMISSION

Well in advance of the opening of the semester for which the student seeks admission, he should correspond with and preferably have a personal interview with the Dean or department chairman of his proposed field of study, to discuss the University's facilities for guidance in this field, the applicant's qualifications, and the possibilities of an effective doctoral program. If an application for admission is indicated, the student will be advised concerning the details of application procedure.

LANGUAGE REQUIREMENTS

A reading knowledge is required of two foreign languages important in the student's field of interest. One language examination must be passed at the time of beginning doctoral study. The second must be passed before admission to the qualifying examination and within one year of the start of study for the qualifying examination.

STUDY FOR QUALIFYING EXAMINATION

Upon admission to study for the qualifying examination the student is assigned a faculty adviser, who directs his studies. The adviser designates fields of learning to insure the student's breadth of knowledge and support research in his central field, advises him concerning the scope and content of these fields of study, and guides him in preparation for his examination. A minimum of 30 semester hours of formal study beyond the Master's work is required prior to the qualifying examination. This requirement does not include any deficiencies to be made up or language courses taken to meet the language requirement.

The purpose of the qualifying examination is to ascertain that the student's breadth of background and intellectual development are adequate to support doctoral research and investigation in his central field. The qualifying examination may be both written and oral and usually extends over a period of six days. It is given by a special committee consisting of members of the Faculty and other specialists. Upon favorable report of the examiners to the Dean through the appropriate department chairman, the student is admitted to candidacy for the degree, to pursue his specialized study and research under the supervision of a designated member of the Faculty.

The examination is the sole test of the student's ability to qualify for admission as a candidate for the degree, and to enter the second stage of his doctoral discipline.

RESEARCH, DISSERTATION, FINAL EXAMINATION

The student admitted to candidacy for the degree requests as Director of Research the member of the Faculty under whom he wishes to conduct his research. The Faculty member may accept or reject such request. The research area is approved by the Director and the appropriate department chairman or the Dean. Throughout the remainder of the doctoral program, the candidate is responsible solely to his Director, in his research and in the presentation of his dissertation. Work on the dissertation is equivalent to a minimum of 24 semester hours.

THE DISSERTATION

A dissertation is required as evidence of ability to perform scholarly research and to interpret and present its results.

The candidate must submit to the appropriate department four complete copies of the dissertation and two original copies of an abstract (not to exceed 600 words) of his dissertation no later than the date specified in the calendar. One copy of the abstract is for inclusion in the announcement of the examination and one for reproduction by University Microfilms, Inc. One copy of the dissertation is also sent to University Microfilms, Inc.

Printed copies of detailed regulations regarding the form and reproduction of the dissertation, preparation of the abstract, and services offered by University Microfilms, Inc., are available at the School Office. The successful candidate for the doctorate is required, before receiving his degree, to pay a fee to cover the expense of printing the abstract of his dissertation, and for the basic service rendered by University Microfilms, Inc. Accepted dissertations, with accompanying drawings, become the property of the University and are deposited in the University Library and the School's Library, where copies are bound and made available for circulation. Permission to publish or adapt material in them must be secured from the Dean.

THE FINAL EXAMINATION

Upon approval of the dissertation by the Director, the candidate is presented for his final examination.

The final examination is oral and is open to the public. The candidate must demonstrate a mastery of his special field of interest and of the materials and techniques used in the research. The committee of examiners includes members of the Faculty competent in the research field or in closely related subjects and may also include qualified experts brought to the University especially to participate in the examination. When the candidate satisfies the examining committee concerning the high quality and originality of his contribution to knowledge as well as his mastery of the scholarship and research techniques of his field, the committee of examiners recommends him for the degree of Doctor of Science.

RESIDENCE AND CONTINUOUS STUDY

All of the work for the degree must be done in residence (on the campus), except when special permission is granted to conduct research in an approved off-campus facility. The student must maintain "continuous registration" in the

School, even when granted a leave of absence. Failure to do so breaks the student's registration, and he must apply for readmission to doctoral study under whatever new conditions and regulations are set up by the department chairman and approved by the Dean.

There is no formal regulation concerning the minimum amount of time to be spent in preparation for the qualifying examination or as a candidate engaged in doctoral research. However, the qualifying examination must be completed within five years of the date of admission, and the entire degree program must be completed within seven years. After admission the student may apply for his qualifying examination whenever his adviser believes that he is prepared to take it: his research and specialized study may be undertaken with whatever concentration of time meets the approval of his Director of Research. Normally a minimum of two years of full-time study and research is spent in meeting the requirements for the degree.

The Center for Measurement Science

THE CENTER, UNDER THE DIRECTION of the School of Engineering and Applied Science, is a cooperative activity of the University, industry, and government providing education, research, and service programs related to measurement. It was established by the University in 1960.

The principal, but not exclusive, activities of the Center are:

- The education of persons for careers in measurement science;
- The development and improvement of measurement, standardization, and calibration techniques, apparatus, and data—with particular reference to high precision;
- The provision of staff and facilities to industry for research and consultation on measurement problems in industry, including the maintenance of primary standards of measurement directly traceable to the national standards;
- The publication of results of research, manuals of practice and procedures, and information related to measurement science.

The Center maintains relations with industry and government through its Associate Program, in which interested individuals, companies, or other organizations may participate. The mutual communication, collaboration, and support made possible by this program bring vitality to the Center activities and insure attention to the needs of industry and government.

Through these and other activities the Center serves as a source of personnel competent in measurement science, as an instrument for collaborative research on measurement problems, and as a service organization providing expert capability to industrial and government organizations in the solution of their measurement problems.

EDUCATION PROGRAM

The Education Program of the Center consists in part of curricula offered by the School, which prepare the student to assume responsibilities in the field of measurement science. The curricula are integrated, to permit a student to ter-

minate his formal education at any level, or to proceed to the next level. Programs lead to the degrees of Bachelor of Science, Master of Science, and Doctor of Science.

In addition to the degree programs, the education program includes seminars, special conferences, and short courses offered from time to time.

RESEARCH PROGRAM

The Research Program of the Center includes all aspects of research and development related to measurement science. Research and/or development may be undertaken as independent studies by staff members for the Center, as studies for a sponsor under contract, or by personnel of Associates of the Center assigned to the Center to undertake the specific work. Associates receive publications of the Center; certain publications may be restricted in distribution.

SERVICE PROGRAM

The Center arranges for consultation and assistance of the Faculty and Staff and the use of the facilities of the Center in connection with specific problems in measurements. The program is restricted to the use of the Associates of the Center.

The Service Program also makes it possible for Associates to engage the various resources of the University, through the Center, as may be desirable and feasible, in solution of their problems of measurement.

Continuing Engineering Education Program

THE SCHOOL OF ENGINEERING AND APPLIED SCIENCE has recently undertaken a major expansion in its program of continuing engineering education. The objective of this program is the specific enhancement of the competence of the individual as a practicing engineer, rather than the attainment of an additional academic degree. Studies of the American Society for Engineering Education and other groups have emphasized the increasing importance of such programs as each year brings greater scientific and technological advances.

In the past several years the School has offered a small number of courses in continuing engineering education. The response to these courses has indicated that there is an unfulfilled need in this area of study. In the Northeast, Middle West, and West Coast areas, a number of universities are already offering several hundred such courses. However, in the Middle Atlantic and South Atlantic regions, and particularly in the Washington metropolitan area, no regional university has offered more than token services.

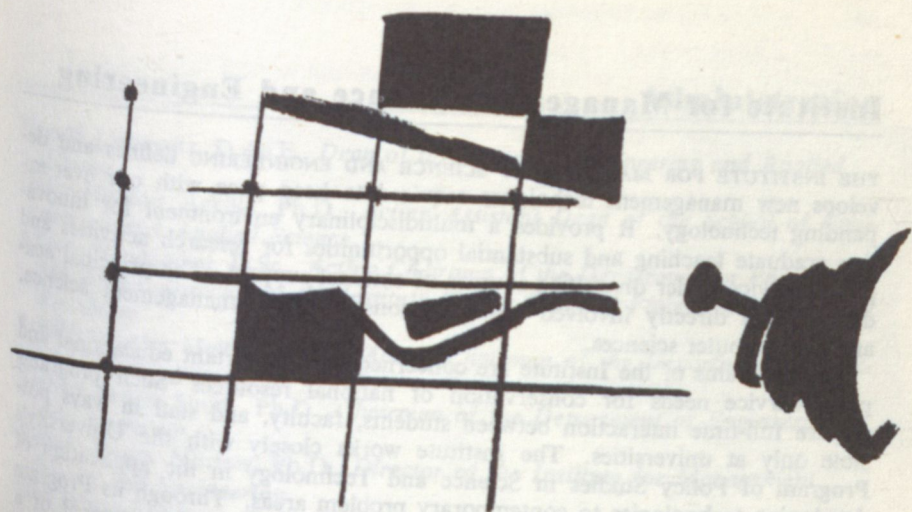
In its expanded program, the School offers an adequate number of courses each year; approximately half of them last five days (30 classroom hours); the remainder meet either for three days (18 classroom hours) or one night a week for eight weeks (16 classroom hours).

In addition to the School's faculty, lecturers and instructors for these courses are drawn from industry and government—the National Bureau of Standards, NASA-Goddard Flight Center, and NASA-Langley Research Center, for example.

The GWU—NASA-Langley Graduate Program

GEORGE WASHINGTON UNIVERSITY, in cooperation with the National Aeronautics and Space Administration's Langley Research Center, has initiated a full-resident graduate engineering program at NASA-Langley, in Hampton, Virginia, approximately 200 miles south of Washington, D.C. Through special arrangement, the University's on-campus students in various fields of engineering can utilize, when feasible, NASA-Langley's extensive scientific and engineering facilities and equipment. In addition, the faculty at NASA-Langley may be called upon to teach specialized courses at the School of Engineering and Applied Science.





The program at NASA-Langley leads to the degree of Master of Science in the fields of aeronautics, applied mechanics, astronautics, mechanical engineering, and electrical and computer engineering. Areas of study and research include acoustics, solid mechanics and materials science, electronics, fields and waves, computer science, structural engineering, fluid mechanics, thermal sciences, controls and systems, networks, mathematical methods in engineering, and aerospace engineering with options in aeronautics and astronautics.

Institute for the Study of Fatigue and Structural Reliability

THE INSTITUTE FOR THE STUDY OF FATIGUE AND STRUCTURAL RELIABILITY is a major resource center at the School of Engineering and Applied Science. It is under the technical direction of Dr. A.M. Freudenthal, an internationally recognized authority. In addition to advancing interdisciplinary research, the Institute provides specialized training for graduate students in these fields.

The basic objective of the Institute is to develop an interdisciplinary approach to fatigue research through close cooperation of research workers from different fields. The Institute deals principally with the study of the physical mechanism of damage initiation, in order to establish principles for the rational design of metal alloys of superior fatigue performance on the one hand, and to develop advanced methods of fatigue design and reliability on the other. Because of the large volume, past and current, of straight fatigue testing of standard test specimens in industrial, government, and university laboratories, no testing of this type is generally conducted by the Institute. However, results of such tests appearing in publications and reports are carefully scrutinized for their significance in terms of the purposes of the Institute.

The Institute conducts seminars, issues technical reports, and supplies information, lectures, and consultations to many government and industrial research and development laboratories.

Institute for Management Science and Engineering

THE INSTITUTE FOR MANAGEMENT SCIENCE AND ENGINEERING defines and develops new management techniques required to keep pace with our ever-expanding technology. It provides a multidisciplinary environment for innovative graduate teaching and substantial opportunities for research activities and public service under diversified sources of external support. The principal academic fields directly involved are operations research, management science, and the computer sciences.

The programs of the Institute are concerned with important educational and public-service needs for conservation of national resources. Such programs require full-time interaction between students, faculty, and staff in ways possible only at universities. The Institute works closely with the University's Program of Policy Studies in Science and Technology in the application of developing technologies to contemporary problem areas. Through its Program in Logistics, the Institute performs research leading to the development of a science of logistics featuring principles and methodology for resource allocation problems in civil affairs and national defense efforts.

Participation by faculty members and graduate students from all schools in the University is encouraged as consistent with the multidisciplinary objectives of the Institute. Graduate students are supported through research assistantships with thesis and dissertation efforts ordinarily being the major work responsibilities. Reliance is also placed on staff research specialists, and there are special provisions for substantial contributions from "distinguished visitors" from government, private industry, and other universities.

The Institute disseminates its results through seminars, colloquia, conferences, and a special series of monographs. All of the research is unclassified.



W.H. Marlow, Director of the Institute for Management Science and Engineering

Administration

- Harold Liebowitz, D.Ae.E., *Dean of the School of Engineering and Applied Science*
- Galip Mehmet Arkilic, Ph.D., *Acting Assistant Dean of the School of Engineering and Applied Science*
- Alfred Freudenthal, D.Sc., *Acting Chairman of the Department of Engineering Mechanics; Director of the Institute for the Study of Fatigue and Structural Reliability*
- Arnold Charles Meltzer, D.Sc., *Acting Chairman of the Department of Electrical Engineering*
- Herbert Ernest Smith, Ph.D., *Chairman of the Department of Engineering Administration*
- William Henry Marlow, Ph.D., *Director of the Institute for Management Science and Engineering*
- John Edward Duberg, Ph.D., *Director of the NASA-Langley Graduate Program*
- I. Edward Garrick, B.S., *Assistant Director of the NASA-Langley Graduate Program*
- S. Walter Hixon, Jr., B.S., *Administrator of the NASA-Langley Graduate Program*
- Dick Johnston Cole, *Assistant Administrator of the NASA-Langley Graduate Program*
- Jack Emerson Mansfield, B.S. in E.E., *Director of the Continuing Engineering Education Program*
- Charles Donald Brown, B.S., *Continuing Engineering Education Officer*
- Frederic A. Hooper, B.S. in M.S., *Research and Resources Officer*
- W.J. Scot Mannion, B.A., *Director of Engineering Admissions*
- George Ellowitz, B.A., *Executive Assistant to the Dean*

DEAN'S COUNCIL

- Harold Liebowitz (*Chairman*), G.M. Arkilic, R.E. Cronin, P.S. Shane

ACADEMIC CONSULTANT

- Lofti A. Zadeh, Ph.D., *Chairman of the Department of Electrical Engineering and Computer Sciences, University of California, Berkeley*

Advisory Council*

THE PURPOSES of the Advisory Council for the School of Engineering and Applied Science are to strengthen communication between the School and the other colleges, schools, and divisions of the University as well as between the School and the University's Board of Trustees; to advise on the programs of

* The President of the University, the Vice President for Academic Affairs, and the Dean of the School of Engineering and Applied Science are ex officio members of the Advisory Council.

instruction, research, and service in the School and to help interpret these programs to the community and the Nation; and to stimulate support for the continued development of the School and its programs.

MEMBERS OF THE COUNCIL

Chairman: Stephen R. Woodzell (*University Trustee*), *President, Potomac Electric Power Company*
Donald Gross, *Associate Professor of Engineering and Applied Science*
William J. Harris, *Assistant Director—Technology, Battelle Memorial Institute*
Herman H. Hobbs, *Professor of Physics*
George D. Lobingier, *Director, Graduate Education, Westinghouse Corporation*
Louis Polk, *President, Louis Polk, Inc.*
Arthur W. Sloan, *Chairman of the Board, Atlantic Research Company*
E.A. Wareham, Jr., *Associate, Frank Sullivan Associates*
Harold A. Wheeler, *President, Wheeler Laboratories, Inc.*



GENERAL INFORMATION

Registration

THE DATES, HOURS, AND PLACE OF REGISTRATION will be stated in the *Schedule of Classes*, which is available well in advance of each semester.

A student cannot register for classes until he has received a letter of admission to the University issued by the appropriate admitting office.

No registration is accepted for less than a semester or one summer session.

A student may not register concurrently in this University and another institution without the prior permission of the dean of the college, school, or division in which he is registered in this University. Registration in more than one college, school, or division of the University requires the written permission of the deans concerned, *prior to registration*. Allowance of credit for work done concurrently at another institution is at the discretion of the appropriate committee.

ELIGIBILITY FOR REGISTRATION

Registration for the following categories of campus students is held on the days of registration stated in the University Calendar. No student who is suspended or whose record is not clear for any reason is eligible to register.

New Student.—Upon receipt of a letter of admission, the new student is eligible for registration on the stated days of registration.

Readmitted Student.—A student previously registered in the University who was not registered for campus courses during the preceding semester or summer session must apply for and receive a letter of readmission from the appropriate admitting office before he is eligible for registration. A student registered for the spring semester of 1970 need not apply for readmission for the fall semester 1970-71. Such a student is a "Continuing Student."

Continuing Student.—The student registered for campus courses in the immediately preceding semester of the academic year is eligible to register upon presentation of his student identification card from the previous semester. The

student registered for the 1970 Summer Sessions campus courses, and not restricted to summer registration, is eligible to register for the 1970-71 fall semester on presentation of his 1970 Summer Sessions student identification card.

REGISTRATION CHANGES AND WITHDRAWALS (see pages 52, 54, 63)

Fees and Financial Regulations

FEES PAID BY STUDENTS cover only a portion of the cost of the operation of the University. Income from endowment funds, grants, and gifts from alumni and friends of the institution make up the difference.

The following fees and financial regulations were adopted for the academic year 1970-71. (See pages 52-53 for projected tuition increases for 1971-74.)

Tuition Fees

For undergraduate study:

Full-time program (12 or more hours a semester).....	\$975.00
Part-time program, for each semester hour.....	68.00

For graduate study* (except for those students registered before July 1, 1967, who wish to continue payments in accordance with the plan (see below) in effect prior to that date):

For each semester hour for which the student registers.....	68.00
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Doctoral students not enrolled under the payment plan in effect before July 1, 1967, are required to register for minimum hour-loads,† as follows:

1. Full-time doctoral students must register for a minimum of 12 semester hours a semester until 24 hours of work have been completed beyond the qualifying examination; and a minimum of 4 semester hours a semester thereafter until the satisfactory completion of the final examination.
2. Part-time doctoral students must register for a minimum of 6 semester hours a semester until 24 hours of work have been completed beyond the qualifying examination; and for a minimum of 4 semester hours a semester thereafter until the satisfactory completion of the final examination.

For candidates for Master's degrees registered prior to July 1, 1967, who wish to continue payments according to the plan in effect prior to that date:

Total fee, including the Master's Comprehensive Examination†.....	1,950.00
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* Registration in thesis courses (299-300) entitles the student, during such registration, to the advice of the member of the faculty under whom the thesis is to be written. In case a thesis is unfinished an additional semester will be granted, requiring payment of a "Continuous Registration" fee (see page 52). If the preparation of the thesis extends beyond the three-semester period, approval for this extension will be required and the student must repeat the thesis course 300 and pay tuition as for a repeated course, provided the over-all time limit for earning the degree is not exceeded.

† No minimum hour-load is required during the summer sessions.

‡ Students completing payment of the total fee before completion of the required work (including thesis and comprehensive examinations) will be granted registration on a "continuous registration—no charge" basis for one semester immediately following the semester in which tuition payment is completed.

Students requiring additional time for completion of required work after completion of payment of the total fee and the expiration of a semester "continuous registration—no charge" must register each semester and pay the normal "continuous registration" fee. See page 65 for regulation governing Military Leave.

For students registered for the degree of Doctor of Science prior to July 1, 1967, who wish to continue payments according to the plan in effect prior to that date:

For work leading to and including the qualifying examination*.....	\$1,900.00
For work leading to and including the final examination*.....	1,900.00

University Center Fee (charged all students registered on campus,† nonrefundable)

For students registered for 11 or more semester hours on campus:	
Each semester	37.50

For students registered for less than 11 semester hours in a semester on campus:	
For each semester hour for which the student registers.....	3.50

For students maintaining "continuous registration" status:	
Each semester	3.50

Additional Course Fees

In certain courses additional fees, such as laboratory and material fees, are charged. These fees are charged by the semester and, unless otherwise indicated, may be defrayed in two payments when the tuition is paid in this manner. Breakage of apparatus is charged against the individual student. When breakage is in excess of the normal amount provided for in the laboratory fee the individual student will be required to pay such additional charges as are determined by the department concerned.

Graduation Fees

Bachelor's, Master's, Doctor's degrees.....	\$25.00
Fee for binding Master's Thesis.....	10.00
Fee for Microfilm Service and Printing Abstract of Doctoral Dissertation	55.00

Residence Hall Fees (see pages 73-74).

*If the tuition for the first stage is paid in full at the beginning of the first stage of the doctoral discipline, the candidate is entitled to five successive semesters on a "continuous registration—no charge" basis. If still more time is needed, the student must maintain continuous registration and pay the continuous registration fee.
 If the tuition is paid in four installments at the rate of \$475.00 a semester at the beginning of the first stage of the doctoral discipline, no continuous registration fee will be charged if a third year is needed for completion of the first stage of the degree requirements. If still more time is needed, the student must maintain continuous registration and pay the continuous registration fee.
 If the tuition is paid in six installments at the rate of \$316.66 a semester and if still more time is needed, the student must maintain continuous registration and pay the continuous registration fee.
 If the tuition for the second stage is paid in full at the beginning of the second stage of the doctoral discipline the candidate is entitled to three successive semesters on a "continuous registration—no charge" basis. If still more time is needed, the student must maintain continuous registration and pay the continuous registration fee.
 If the tuition is paid in two installments at the rate of \$950.00 a semester at the beginning of the second stage of the doctoral discipline no continuous registration fee will be charged if a second year is needed for completion of this stage of the discipline. If the tuition is paid in four installments at the rate of \$475.00 a semester at the beginning of the second stage and still more time is needed, the student must maintain continuous registration and pay the continuous registration fee.
 † Students in off-campus programs are charged the University Center Fee only when registered for courses on campus.

Special Fees

Application fee (degree candidates), nonrefundable.....	\$25.00
Tuition deposit, nonrefundable:	
Charged each entering or readmitted full-time undergraduate student, except early decision freshmen.....	100.00
Charged each freshman admitted by early decision plan.....	200.00
Application for room reservation, nonrefundable:	
Charged each resident student, except early decision freshmen.....	100.00
Charged each resident student admitted by early decision plan.....	200.00
Admission tests (when required).....	6.00-12.00
Late-registration fee, for failure to register within the designated period....	15.00
Service fee, for deferred payment plan (see "Payment of Fees," page 53)....	5.00
Reinstatement fee, for reinstatement after financial suspension for non-payment of fees.....	15.00
Returned check fee, charged a student whose check is returned because of insufficient funds or improper drafting.....	15.00
Continuous registration fee, to maintain "continuous registration" status during any semester of absence from the University or after completion of tuition requirements*—due and payable on the official days of registration	68.00
Engineers' Council fee, charged each student in the School of Engineering and Applied Science for each semester or any part thereof except the summer term	1.50
For each examination to qualify for advanced standing and for each special examination	5.00
English test for foreign students (when required).....	5.00
Laboratory checkout fee, for failure to check out of Chemistry laboratory by the date deadline set by the instructor†.....	3.00
Transcript fee, for each transcript of record.....	1.00

Registration for on-campus courses in the University entitles each student to the following University privileges: (1) the services of the Student and Alumni Career Services Office; (2) the use of University library; (3) gymnasium privileges; (4) admission to all athletic contests, unless otherwise specified; (5) subscription to the *University Hatchet*, the student newspaper; (6) admission to University debates; (7) medical attention and hospital services as described under Health Services. These privileges terminate when the student withdraws or is dismissed from the University.

PROJECTED TUITION INCREASES 1971-74

In order that students and their parents may plan more realistically for a total four-year period, tuition increases for the academic years 1971-72, 1972-73, and 1973-74 have been estimated as follows:

* Payment of the continuous registration fee entitles the student who is granted leave of absence to return and continue his work toward a degree under the academic requirements which were in force at the time of his first registration. The continuous registration fee applies toward neither tuition fee nor residence requirements for the degree. (See also footnotes on pages 50 and 51.)

See page 65 for regulation governing Military Leave.

† A student who drops a chemistry course before the end of the semester must check out of the laboratory at the next regular laboratory period.

Increase by year (full-time undergraduate students):	
1971-72	\$150.00
1972-73	150.00
1973-74	200.00
Increase by semester hour (graduate and part-time undergraduate students):	
1971-72	6.00
1972-73	8.00
1973-74	8.00

Every effort will be made to keep tuition increases within the above limits. However, it is not possible to project future economic data with certainty, and circumstances may require an adjustment in these estimates.

PAYMENT OF FEES

All fees are payable at the Office of the Cashier. No student is permitted to complete registration or attend classes until all fees are paid.

Tuition and fees for each semester are due and payable in full at the time of each registration.

However, a student registered for six semester hours or more may sign a contract with the Student Accounts Office at the time of each registration permitting him to pay one-half of the total tuition and fees (except for fees payable in advance) at the time of registration and the remaining half on or before November 4, 1970 (for the fall semester) and March 17, 1971 (for the spring semester). A service fee of \$5 will be due and payable at the time of registration for the use of this deferred payment plan. The University will not obligate itself to notify the student in advance of the payment-due date for the second half of the semester charges. Students who fail to make any payment when due will be automatically suspended and may not attend classes until they have paid all accrued fees and the \$15 reinstatement fee and have been officially reinstated by the Student Accounts Office.

A student suspended for failure to meet payments when due may not be reinstated for the semester after two weeks from the date of suspension. Applications for reinstatement are to be made to the Student Accounts Office.

An auditor pays all fees chargeable to the student registered for credit.

Because many parents may wish some option in meeting and financing all or part of the cost of a college education, the University offers educational loan plans through the Girard Trust Bank in Philadelphia, Pennsylvania; Funds for Education, Inc., Manchester, New Hampshire; and The Riggs National Bank, Washington, D.C.

Although similar in purpose, these plans vary somewhat in coverage and conditions. One-year and multiple-year plans are available. Insurance covering the life and health of the sponsor is provided through these plans.

Individuals over twenty-one years of age who are employed full-time are also eligible to apply. They may sponsor their own contracts, provided they meet the conditions specified by the plan for which they are applying.

Brochures and applications describing these plans are available in the Office of Student Financial Aid.

WITHDRAWALS AND REFUNDS

Applications for withdrawal from the University or for change in class schedule must be made in person or in writing to the Dean of the School. Notification to an instructor is not an acceptable notice (see "Withdrawal," page 63).

In authorized withdrawals and changes in schedule, cancellations of semester tuition charges and fees will be made in accordance with the following schedule:

1. Complete withdrawal from the University:

Fall Semester

Withdrawal dated on or before September 25, 1970.....	90 per cent
Withdrawal dated September 28 to October 9, 1970.....	75 per cent
Withdrawal dated October 12 to October 23, 1970.....	50 per cent
Withdrawal dated after October 23, 1970.....	none

Spring Semester

Withdrawal dated on or before February 5, 1971.....	90 per cent
Withdrawal dated February 8 to February 19, 1971.....	75 per cent
Withdrawal dated February 22 to March 5, 1971.....	50 per cent
Withdrawal dated after March 5, 1971.....	none

2. For a change in status from full-time to part-time student or for partial withdrawal by a part-time student, the above schedule applies to the difference in charges between the original program and the adjusted program continuing in effect.
3. A student enrolled in a full-time program who drops or adds a course and continues to be in a full-time program will have no financial adjustments of tuition made other than those involving course fees.
4. A student who is granted military leave before completing a semester is given credit for all tuition paid for that semester, for use upon his return to the University. No tuition will be refunded to a student granted military leave (see "Military Leave," page 65).

In no case will tuition be refunded or reduced because of absence from classes. Payment applies only to the semester for which a registration charge is incurred, and in no case will this be credited to another semester.

Authorization to withdraw and certification for work done will not be given a student who has not a clear financial record.

Students are encouraged to provide their own cash funds until they can make banking arrangements in the community.

Financial Aid*

FOR UNDERGRADUATE STUDY

THE GEORGE WASHINGTON UNIVERSITY has a program of financial assistance for undergraduate students of scholarships, loans, grants, part-time employment, or any combination of these resources. The University participates in the National

* For information concerning financial aid for students from foreign countries, see page 59.

Defense Student Loan, Educational Opportunity Grant, and College Work-Study programs. Financial aid is awarded on the basis of the student's scholastic record, financial need, and qualities of leadership and character.

Scholarships are awarded for the academic year.

Applications and supporting credentials for financial aid must be filed by February 1 (entering freshmen), March 1 (enrolled undergraduate or entering transfer students) preceding the academic year of the award for the fall semester; by October 31, for the spring semester; and by May 1, for the summer session*.

Credentials required of all financial aid applicants:

1. *Application for Financial Aid* forms for entering freshmen and transfer students will automatically be forwarded to the student when the Office of Admissions notifies the Office of Student Financial Aid that an Application for Admission has been received and the student indicates he will apply for financial aid. Students presently enrolled in the University may obtain forms upon request, at the Office of Student Financial Aid.

2. *Parents' Confidential Statement* (Code 5246) must be filed by all applicants who are under twenty-five years of age, married or single, dependent on or independent of parental support. Students who are applying for aid for the academic year (September-June) and for the spring semester should file the *Parents' Confidential Statement* with the College Scholarship Service, Box 176, Princeton, N.J. 08540; Box 1925, Berkeley, Calif. 94701; or Box 881, Evanston, Ill. 60204, no later than two weeks prior to the deadline dates for application, see dates above. Students applying for financial aid for the summer session *only* should file the *Parents' Confidential Statement* directly with the Office of Student Financial Aid, George Washington University.

Entering freshmen may obtain forms at local secondary schools or upon request to the College Scholarship Service. All other applicants may obtain forms, upon request, at the Office of Student Financial Aid.

An undergraduate *transfer* student is not eligible for scholarship funds until he has completed one full semester (15 hours) at this University with a minimum average of B (3.0). A transfer student is, however, immediately eligible for other types of financial aid.

SCHOLARSHIPS

Scholarships are awarded for the academic year unless otherwise specified and are credited in equal parts for each semester. Each holder must carry a full schedule of academic work during the period for which the scholarship is awarded.

Applications should be submitted on or before February 1, for the following academic year and, unless otherwise specified, should be addressed to the Office of Student Financial Aid. Awards are made during the month of April. All scholarships begin with the fall semester.

The following scholarships are limited to students in the School of Engineering and Applied Science. The University offers many others which are open to

* A Summer Sessions student is eligible for consideration only if he is enrolled in this University for at least 8 semester hours in the immediately preceding spring semester or has applied for financial aid for the following fall semester.

engineering students. A special bulletin containing a complete list and full information concerning fellowships and scholarships may be obtained from the Office of Student Financial Aid, George Washington University, Washington, D.C. 20006.

*Association of Federal Communications Consulting Engineers Scholarship (1958).**—A full-tuition scholarship, including laboratory fees and books. Available to a student of good character, promise, and leadership working toward the degree of Bachelor of Science (Electrical Engineering) and intending to major in communications.

Frederick Albert and Alma Hand Britten Scholarships (1959).—Bequest of Alma Hand Britten for scholarship assistance to students entering the School of Engineering and Applied Science who would not otherwise be able to pursue such professional study. Available for undergraduate and graduate study.

Henry Harding Carter Scholarship (1896).—Established by Maria M. Carter in memory of her husband to aid a deserving student who is preparing for the civil engineering profession. Available to students working toward the degree of Bachelor of Science (Civil Engineering).

Henry Parsons Erwin Scholarship (1955).—Established by Helen B. Erwin as a memorial to her husband, a former Trustee of the University. A partial scholarship for a student in Engineering and Applied Science.

Louis E. Giles Memorial Scholarships (1966).—Bequest of Susie E. Giles in honor and memory of her husband for scholarships to undergraduate and graduate students in the School of Engineering and Applied Science requiring financial assistance.

George Washington University Board of Trustees Scholarships.—Full- and partial-tuition undergraduate scholarships which will begin in the fall semester and extend for four successive academic years, provided the holder maintains a B average, as well as a high standard of deportment, and continues to be in financial need. Candidates must plan to select a curriculum leading to a Bachelor's degree.

GRANTS

Disadvantaged Students Grants-in-Aid (1968).—Full- and partial-tuition grants available to disadvantaged students from the Washington Metropolitan Area.

Educational Opportunity Grants.—Authorized by the Higher Education Act of 1965 and available to undergraduate students with great financial need. The applicant must show academic promise, be accepted for enrollment on a full-time basis, or be a currently enrolled full-time student in good standing. Students may receive Educational Opportunity Grants for each year of their higher education up to four years.

Inner-city Student Tuition Grants (1968).—Full- and partial-tuition grants available to disadvantaged students from the District of Columbia.

Marriott Corporation Grant (1968).—Funds provided by the Marriott Corporation to help a needy minority group student.

Walt Whitman High School Key Club Grant-in-Aid (1968).—Tuition and expense grant for a disadvantaged student from the District of Columbia.

* This scholarship is renewable and is, therefore, not available each year for award to an incoming freshman.

ported by annual fund drives conducted by students of the Key Club at Walt Whitman High School in Bethesda, Maryland.

FOR GRADUATE STUDY

SCHOLARSHIPS, FELLOWSHIPS, ASSISTANTSHIPS, TRAINEESHIPS

The George Washington University program of financial assistance for graduate students includes graduate scholarships, fellowships, assistantships, and loans. Application for admission to graduate study is a prerequisite for consideration. The University participates in the National Defense Student Loan and College Work-Study programs.

Application and correspondence concerning graduate scholarships, fellowships, or assistantships, unless otherwise specified, should be sent directly to the Dean of the School, and addressed to George Washington University, Washington, D.C. 20006. Unless otherwise specified, application and supporting credentials should be submitted not later than March 1 preceding the period for which the award is made.

A separate application for National Defense Student Loans or the College Work-Study Program must be submitted to the Office of Student Financial Aid by April 1 for the following academic year.

Frederick Albert and Alma Hand Britten Scholarships (1959).—See page 56.

Paul H. and Margaret M. deMaine Scholarships (1967).—Full and partial scholarships for graduate students whose research involves the use of computers. Inquiries should be made to the Director of the Computer Center of the University.

Louis E. Giles Memorial Scholarships (1966).—See above.

Phi Delta Gamma Scholarship Endowment Fund (1968).—Established by the Beta Chapter of Phi Delta Gamma, national fraternity for graduate women. For graduate women students.

Graduate Teaching Fellowships.—Available to students in Master's and doctoral programs. Each teaching fellow renders a designated unit of service to his major department of instruction and receives a stipend of up to \$2,800 (on a 9-month basis), plus tuition and course fees.

National Science Foundation Graduate Fellowships.—Fellowships, including tuition, fees, stipends of \$2,400 to \$2,800 (on a 12-month basis), and allowances of \$500 a year for dependent spouse and each dependent child. No awards are made for clinical areas of study, education, business, or social work. Applications should be made to the Fellowship Office, National Academy of Sciences, National Research Council, 2101 Constitution Avenue, N.W., Washington, D.C. 20418.

National Science Foundation Graduate Traineeships.—Available to students in sciences. Traineeships include tuition, stipends of \$2,400 to \$2,800 (on a 12-month basis), and stipulated allowances for dependents. Inquiries and applications should be submitted prior to February 15 to the Graduate School of Arts and Sciences.

Research Assistantships in Operations Research and Related Fields.—Available to graduates, and to undergraduates on the junior and senior levels, in any school of the University. Research Assistants are expected to work 20 hours a week conducting research in support of an established research program, in programming or in conducting individual research on an approved research

project. Stipends vary from \$3,124 to \$6,449, depending on the status of the student and the tenure of the appointment (9–12 months). Further information and applications are available from the Director, Institute for Management Science and Engineering, Staughton Hall, 707 Twenty-second Street, N.W., Washington, D.C. 20037.

Resident Assistantships.—Available to graduate students in any field of study who are interested in working with the student personnel program in University residence halls. Specific duties vary with the position, but basically consist of counseling, advising student groups, and administration. Remuneration varies according to the responsibilities and demands of the position. All positions are part-time, enabling staff members to enroll as full-time students. Further information may be obtained from the Office of the Associate Dean of Students for Residence Halls and Counseling.

LOAN FUNDS

The following loan funds are available to students in the University in accordance with the qualifications placed thereon by the donors. Students should direct inquiries to and file applications with the Office of Student Financial Aid. Applicants for a National Defense Education Act Student Loan or a United Student Aid Fund loan must file a *Parents' Confidential Statement* and an *Application for Financial Aid*. Deadline for submitting applications with supporting credentials is February 1 (entering freshmen), March 1 (enrolled undergraduate or entering transfer students), April 1 (graduate students) preceding the academic year of the award; October 31, for the spring semester; and May 1, for the summer session*. Application for admission to the University is a prerequisite for consideration.

National Defense Education Act Student Loan Program.—This fund is available to full-time graduate or undergraduate students in good academic standing who are in need of financial assistance. An undergraduate student may borrow for college expenses a sum not exceeding \$1,000 a year and, during his entire undergraduate program, a sum not to exceed \$5,000. A graduate or professional student may borrow a maximum of \$2,500 a year. The total loans made to such a student for all years, including any loans made to him as an undergraduate, may not exceed \$10,000.

State Guaranteed Loan Program.—These loans, provided for in Title IV Part B of the Higher Education Act of 1965, are administered by each state. A student wishing further information should contact the Department of Higher Education in the state in which he is a legal resident.

Warren Stickler Memorial Loan Fund (1966).—A fund established by the Precision Measurements Association as a memorial to Warren Stickler is available to students in the Measurement Science curricula.

U.S. Loan Program for Cuban Students.—Cuban Nationals, enrolled as full-time students, who are unable to receive support from sources within Cuba because of action by the Cuban Government, may borrow not more than \$1,000 a year or \$500 for one semester.

United Student Aid Fund Loan.—This fund is available to full-time graduate and undergraduate students who have completed the freshman year and are in

* A Summer Sessions student is eligible for consideration only if he is enrolled in this University for at least 8 semester hours in the immediately preceding spring semester or has applied for financial aid for the following fall semester.

need of financial assistance. Students may borrow up to \$1,500 a year. The total loans made to a student, including any loans made to him as an undergraduate, may not exceed \$7,500. Application must be made and approved through the University by the date deadlines stated above.

John Brewster Willis, Jr., Loan Fund in Mechanical Engineering.—A fund of \$1,515, established by Mrs. William L. Lane as a memorial to her nephew, John Brewster Willis, Jr., is available to Mechanical Engineering students (graduate or undergraduate) who are primarily interested in aeronautics.

A number of short-time emergency loan funds are also available at the University. Information concerning these funds is contained in a special bulletin available from the Office of Student Financial Aid.

COLLEGE WORK-STUDY PROGRAM

The Federal College Work-Study Program provides part-time jobs both on and off campus for full-time students with financial need. Applications and information are available at the Office of Student Financial Aid.

STUDENT EMPLOYMENT

The Student and Alumni Career Services Office maintains a registry of both full-time and part-time positions available in the Washington area for undergraduate and graduate students.

After registration, interested students may apply at the Student and Alumni Career Services Office, 2033 G Street, N.W., for interviews and referrals to positions for which they are qualified.

FOREIGN STUDENTS

Undergraduate foreign students with proven financial need who have completed one semester of full-time work (15 hours) at this University with a *B* average (3.00) or better are eligible for consideration for University Board of Trustees Scholarships. Scholarships are awarded in the spring for the following academic year. See instructions for applying for undergraduate financial aid, pages 54-55.

Limited awards for graduate teaching fellowships are the responsibility of the chairman of the department or dean of the school in which the degree is to be earned. Work as a teaching fellow requires excellent knowledge of English—both spoken and written.

Long-term loan funds for undergraduate and graduate foreign students are limited in amount and are available only to those foreign-born persons who have established resident status in the United States through the Immigration and Naturalization Service.

Students who wish to study in the United States should have available sufficient funds to cover expenses for one full year before attempting to enter a college or university. The cost at this University for one academic year (September-June) is approximately \$4,100. This estimate includes room and board, tuition, books, clothes, and incidental expenses; no travel, holiday, or medical expenses are included.

Prizes

Norman B. Ames Memorial Award.—Established by many friends of Professor Ames and awarded annually to a graduating senior of the School of Engineering and Applied Science who is nominated by his fellow students as having made significant contributions to the students in the School of Engineering and Applied Science and to the School and University.

Martin Mahler Prize in Materials Testing.—A one-year membership in the American Society for Testing Materials awarded to the upper division or graduate student in engineering who submits the best reports on tests in the materials laboratories course with preference given to prestressed concrete tests.

School of Engineering and Applied Science Distinguished Scholar.—A certificate awarded annually by the Faculty of the School of Engineering and Applied Science to the senior who graduates with the highest scholastic standing. The student's name is engraved on a plaque displayed in Tompkins Hall of Engineering.

Sigma Tau Prize.—A medal awarded annually by Xi Chapter to the freshman in the School of Engineering and Applied Science who maintains the highest scholastic standing in the work of the entire year.

Theta Tau Activities Plaque.—A plaque awarded annually by Gamma Beta Chapter to the senior in the School of Engineering and Applied Science with the most outstanding record in activities for the entire period of his attendance.

Regulations

A STUDENT ENROLLED in the School of Engineering and Applied Science is required to conform to the following University regulations.

A student who withdraws or is suspended, or is otherwise absent from the University for one semester or more, may re-enter and continue his work only under the rules and regulations in force at the time of his return.

If a student knowingly makes a false statement or conceals material information on an application for admission, registration card, or any other University document, his registration may be canceled. If such falsification is discovered after the student has established an academic record at the University, he may be subject to dismissal from the University. Such a student will be ineligible (except by special action of the Faculty) for subsequent registration in the University.

ACADEMIC DISHONESTY

Academic dishonesty on the part of any student will result in a disciplinary grade of *F* for the course involved and also may, upon the recommendation of the appropriate dean's council, result in his suspension from the University for a stated period, at the end of which time he may petition for readmission. The disciplinary grade of "Failure—Academic Dishonesty" will be recorded for the course involved, and this grade will be employed in the computation of the quality-point index. A student so suspended shall be withdrawn from all other courses except those in which all work has been completed.





CHANGES IN PROGRAM OF STUDIES

A student may not make any changes in his approved program of studies without the approval of the Dean. Requests for change in class registration must be made on form provided in the School Office.

During the seven days following the first day of classes of a semester, courses may be added to the student's program with the approval of the instructor and the Dean.

Courses may be dropped by undergraduate students without academic penalty only during the fourteen days following the first day of classes, with the approval of the instructor, the student's adviser, and the Dean. Courses may be dropped by graduate students without academic penalty only within the first four weeks of a semester, with the approval of the instructor and the Dean.

WITHDRAWAL

A student who withdraws or is otherwise absent from the University for one semester or more must apply for readmission. If readmitted, he continues his work under the requirements and regulations in force at the time of his readmission.

Applications for withdrawal from the University or for change in class schedule must be made in person or in writing to the Dean of the School. Notification to an instructor is not an acceptable notice.

Withdrawal from a course or from the University, *without academic or financial penalty*, requires the permission of the Dean of the School. Permission to withdraw from the University will not be granted to a student who does not have a clear financial record.

Withdrawal from any course without academic penalty after the fourteenth day following the first day of classes of a semester may be granted by the Dean to undergraduate students only under the following conditions: (1) exceptional circumstances make the request necessary; (2) the request is submitted on the official form for late withdrawal; (3) as of the date of request, the grades in all courses involved are C or better. In exceptional circumstances the Dean may authorize withdrawal for graduate students without academic penalty after the first four weeks of a semester. In all cases financial regulations governing withdrawal remain in full effect.

All charges for courses dropped without the approval of the Dean must be met by the student. Reporting the dropping of a course to an instructor does not effect its discontinuance.

CREDIT

Credit toward a degree is given only after registration for and satisfactory completion of the required work of a course or upon the granting of advanced standing. A student who takes a course as an auditor may not take the same course later for credit.

On request the Registrar will issue to undergraduate degree candidates a balance sheet showing the amount of work completed and the requirements remaining to be met for the degree.

TRANSCRIPTS OF RECORD

Official transcripts of student records are issued on request of the student or former student who has a clear financial record. A fee of one dollar is charged for each transcript.

SUMMER SCHOOL CREDIT

A student who plans to attend summer school at another institution and apply credit so earned toward graduation from this University must first secure the written approval of the Dean. In no event will credit in excess of what might be earned in a similar period in this University be recognized.

CONTINUOUS REGISTRATION

Degree candidates are expected to maintain continuous registration until all degree requirements are satisfied. Students who have completed course registration (including the thesis) maintain continuous registration by paying the "continuous registration" fee (see page 52). By failing to register for one semester or more, the student breaks his registration and must be readmitted. The procedure for readmission for Master's candidates is the same as that for undergraduates (see page 16). A "Readmitted Student" is required to satisfy the curriculum requirements existing at the time of his readmission.

Students must be registered during the summer if they elect to take courses, are taking required examinations, are receiving guidance toward theses or dissertations, or are expecting to graduate at the end of the Summer Sessions.

Students on Military Leave see page 65.

GRADUATION REQUIREMENTS

To be recommended by the Faculty for graduation a student must have met the admission requirement of the School; completed satisfactorily the scholarship, curriculum, residence, and other requirements for the degree for which he is registered; and be free from all indebtedness to the University. Registration, either for course work or on the "continuous registration" fee basis, is required for the semester or summer session immediately preceding the awarding of the degree.

Application for Graduation.—Application for graduation must be filed and the appropriate fee paid at the time of registration for the last semester or summer session of the senior or final year.

Students completing degree requirements during the Summer Sessions will be awarded diplomas (no formal convocation) September 30, *provided* they have completed all degree requirements and have applied for graduation as a part of registration for the Summer Sessions.

Attendance and Conduct.—The University reserves the right to refuse to confer a degree upon a candidate whose attendance or conduct has been unsatisfactory.

THE LIBRARY

All students registered in the University have the privilege of using the University Library. Its stacks are open, and all students are welcome to browse at

their leisure. The Student Identification Card, issued upon the payment of fees, must be presented when books are borrowed for outside use.

The loan period for most books available for outside circulation is 30 days. A fine of 25 cents is charged for each day a book is overdue. Any book which circulates is subject to recall by the Library if needed for reserve or other use. Reserve books must be used in the reserve reading room when the Library is open, except that they may be withdrawn for overnight use beginning at 8:30 p.m. A fine of 50 cents is charged for each hour or fraction thereof that a reserve book is overdue. Grades of a student are withheld until his library record is clear.

All students using the University Library are expected to be familiar with its detailed regulations, available on application to any of the Library's service desks.

MILITARY LEAVE

A student called to active duty may be granted military leave for the period of active duty, upon presentation to his Dean of a copy of his orders and a petition for such leave. The maintenance of "continuous registration" is not required of the student on military leave; however, he must apply for readmission to the University well in advance of the semester in which he expects to return. If a student is granted military leave before he completes a semester for which he has paid all or part of his tuition, this payment will be credited to his account for use upon his return to the University. In no case will tuition be refunded to a student granted military leave.

UNIVERSITY POLICY ON THE RELEASE OF STUDENT INFORMATION

In general, the policy of the University is one of attempting to keep the student's record confidential and out of the hands of those who would use it for other than legitimate reasons. At the same time, the policy must be flexible enough not to hinder the student, the University, or the community in their legitimate endeavors.

No information concerning a student will be released, except as noted below, unless required by court order or subpoena, or requested in writing by the student:

1. Information which is of public record, such as whether or not the student is currently enrolled; dates of attendance; whether or not he received a degree; current address and telephone number; the school or college in which he is enrolled.
2. The issuance of formal transcripts of record to recognized institutions of higher learning; the certification of academic achievement to the various recognized professional associations (law, medicine, engineering, education, etc.); and the inspection of records, under appropriate supervision, by properly validated representatives of government investigative agencies.

UNIVERSITY POLICY ON SELECTIVE SERVICE INFORMATION

The University notifies draft boards of a student's academic status only when the student requests or authorizes, in writing, that the draft board be notified. A Selective Service Information Card is put into the registration packet of each

male student registered on campus, exclusive of those in the National Law Center and the School of Medicine. This card contains the following statement:

By my signature below, I hereby authorize the University to notify my draft board of my academic status in the University, or of any changes in academic status that occur during this semester.

If the student signs the card, the University then automatically notifies the draft board. If the student does not sign the card, no notification is sent. National Law Center students and students in the School of Medicine should check with the appropriate dean's office for details of the policy in their school.

RIGHT TO DISMISS STUDENTS

The right is reserved by the University to dismiss or exclude any student from the University, or from any class or classes, whenever, in the interest of the student or the University, the University Administration deems it advisable to do so.

RIGHT TO CHANGE RULES

The University and its various colleges, schools, and divisions reserve the right to modify or change requirements, rules, and fees. Such regulations shall go into force whenever the proper authorities may determine.

PROPERTY RESPONSIBILITY

The University is not responsible for the loss of personal property in its buildings. A "Lost and Found" Office is located in the Campus Security Office.

RECENTLY ESTABLISHED REGULATIONS

An Appendix (pages 135-36) contains regulations recently approved by the University's Board of Trustees.

Cooperative Programs

CO-OP PROGRAM WITH NAVAL SHIP RESEARCH AND DEVELOPMENT LABORATORY

THIS UNDERGRADUATE PROGRAM is an organized plan which integrates formal study at the School of Engineering and Applied Science with practical experience at the Naval Ship Research and Development Laboratory, Annapolis, Maryland. During this 5-year program it is possible for the student to earn more than \$10,000 on planned technical work assignments at the Naval Ship Research and Development Laboratory, obtain a Bachelor of Science degree in such areas as Civil, Electrical, or Mechanical Engineering, and be in a preferred position upon graduation to obtain a permanent Civil Service position with a grade and salary commensurate with the student's education and experience.

The employment is related to the field of study in which the student is engaged, and it is diversified in order to afford breadth of experience. The work experience increases in difficulty and responsibility, and in general parallels the student's progress through the academic phases of his education.

Tuition, textbooks, and fees (exclusive of room and board) up to 50 per cent may be granted on request. If tuition assistance is received, the Co-Op student must agree to serve as a Government civilian employee after graduation for a period equal to the period for which tuition is granted.

To participate in this cooperative program, the student must be academically acceptable to the University and must meet the requirements of the Civil Service Commission for employment at the Naval Ship Research and Development Laboratory. For additional information, write to Dean Harold Liebowitz, School of Engineering and Applied Science, George Washington University, Washington, D.C. 20006.

CONSORTIUM OF UNIVERSITIES OF THE WASHINGTON METROPOLITAN AREA, INC.

Five universities in Washington, D. C.—The American University, the Catholic University of America, *The George Washington University*, Georgetown University, and Howard University—have formed a Consortium through which they are coordinating the use of their respective facilities. As the arrangement develops, juniors, seniors, and graduate students in approved programs leading to degrees in any one of the universities will increasingly have the opportunity to select from the combined offerings of all five universities the particular courses which best meet their needs.

Participation is limited to campus degree candidates. The following, however, are excluded: freshman and sophomore students, and students in Canon Law, Dentistry, Medicine, and Theology. Law students are also excluded from participation, except for candidates for the degree of Master of Laws at The George Washington University and Georgetown University.

Special courses, such as private instruction (as in music or art) or tutorial study and courses in preparation for passing the language requirement, are excluded from the Consortium program. Also excluded are courses offered in Reserve Officer Training Corps programs.

Students are encouraged to study the announcements of programs of all five universities. Consortium application forms and instructions are available from the Registrar after the student has obtained his registration packet. In order to participate in the Consortium program, the graduate student must obtain the approval of his adviser; the undergraduate student must obtain the approval of his dean. *A student may not take courses at another university that are available at his own.*

The student registers and pays at his own university for all Consortium courses. Specific inquiries should be addressed to the Registrar.

AIR FORCE RESERVE OFFICERS' TRAINING CORPS (AFROTC)

The Department of Aerospace Studies at Catholic University of America, under provisions of an agreement between George Washington University and Catholic University, offers a two-year AFROTC program.

The successful completion of the program qualifies the student for a reserve commission in the United States Air Force upon graduation. Exceptionally well-qualified students may receive a Regular Officer appointment. The program is designed to provide education that will develop skills and attitudes vital to the career professional Air Force Officer. Emphasis is placed on qualities

of leadership and other attributes essential to progressive advancement into positions of increasing responsibility as commissioned officers in the Air Force.

Full-time students who have two years remaining toward a baccalaureate or graduate degree are eligible to enter the program. Each student must meet physical and mental standards set by the Air Force. Candidates must complete six weeks of Field Training, conducted by the Air Force at designated bases, during the summer preceding enrollment into the program. A student must have and maintain a quality-point index of 2.00 or its equivalent. Applications must be made *early* in the academic year prior to the one of enrollment in the program, so that all qualification criteria may be met in time for selection consideration in the spring.

The program is offered at Catholic University. At the time of enrollment a registration fee must be paid. There is no tuition charge. Students in the program receive a monthly retainer fee of \$50. Uniforms and textbooks are furnished without cost. Students participating in the Field Training phase are paid at a rate established by the U.S. Government and are also furnished travel to and from the Field Training base.

Interested students should consult the Department of Aerospace Studies, Catholic University of America, Washington, D.C. 20017.

University Computer Center

THE UNIVERSITY COMPUTER CENTER has facilities available for academic purposes to all registered students and to members of the instructional staff. The Center has as its principal mission the provision of a powerful computing system which serves the University in its educational and research endeavors. The Center's programming staff concentrates its efforts in conducting faculty and staff seminars, consulting with users in the preparation of complicated programs, and carrying out computer-oriented research.

The Computer Center equipment consists of an IBM system 360 Model 50 computer with 256,000 positions of core storage, a 2,314-disk storage unit providing on-line storage for more than 200 million characters, a card read/punch, a high speed line printer, and four tape drives. The principal languages that are available are FORTRAN IV, COBOL, Programming Language One (PL/1), Assembly Language, Report Program Generator (RPG), and ALGOL. In addition, there are numerous utility, statistical, data manipulation, and simulation systems available in the Computer Center Library of Programs. Facilities are available on a first-come first-served basis for preparation of programs and data.

Computer programming courses are offered by the School of Government and Business Administration, the Department of Statistics, and the School of Engineering and Applied Science. In addition, many other departments offer courses that utilize the computer as a research adjunct to course work.

The Computer Center is open 24 hours a day Monday through Thursday and until midnight on Friday. Saturday hours are 9 a.m. to 5 p.m.

The Speech and Hearing Clinic

THE SPEECH AND HEARING CLINIC offers diagnostic and remedial work for children and adults with such communication difficulties as stuttering, lisping, cleft palate speech, cerebral palsied speech, and voice, articulatory, and hearing problems. Diagnostic and remedial work is also available for persons with non-standard language usage due to such conditions as hearing loss, brain damage, mental retardation, and environmental factors.

Fees.—The fee for an initial evaluation is \$20. Fees for additional specialized testing are dependent on the testing involved. The fees for individual speech or hearing therapy range from \$3 to \$10 a session. Fees are reduced for full-time students enrolled in the University and for persons receiving group therapy. Fees are payable at the Office of the Cashier.

The Reading Center

THE READING CENTER offers individual diagnostic and corrective services for all levels: primary, elementary, secondary, and adult. In addition special reading improvement classes are conducted on the high school, college, and adult levels.

A complete diagnosis includes psychological tests; vision, hearing, and dominance tests; and the various reading and spelling tests. Results are interpreted, and a written report is presented in conference with the parents or the individual.

The special reading classes for high school students, college students, and adults are offered throughout the year at stated intervals. Special classes for study skills and spelling are also available. Emphasis is placed on improvement of vocabulary, speed, comprehension, and study skills. Machines such as the tachistoscope, rate accelerator, and controlled reader are also used for increasing speed of comprehension.

Reading Clinic.—The fee for individual diagnosis is \$60; for individual instruction, \$8 a lesson; for semi-individual instruction, \$6 a lesson; for instruction in small groups with common reading difficulties, \$5 a lesson.

Reading Improvement.—Classes are offered for students on high school and adult levels, including college and graduate students. Students are grouped according to needs, and emphasis is placed on vocabulary, study skills, spelling, and speed of comprehension. The fee for full-time students currently registered in the University is \$60 for twenty lessons; for other clients, \$100 for twenty lessons.

All fees are payable in advance at the Office of the Cashier.

Veterans Education

THE OFFICE OF THE REGISTRAR assists students entitled to educational benefits as veterans or war orphans with any problems which may arise concerning their benefits. This Office also processes certification of enrollment and attendance to the Veterans Administration so that monthly allowances will be paid.

When feasible, students entitled to benefits as veterans or war orphans should consult the Office of the Registrar prior to submitting application to the Veterans Administration. All such students should obtain the instruction sheet issued by the Office of the Registrar, which sets forth requirements to be fulfilled before certification of enrollment can be made to the Veterans Administration, and which includes other information of general interest.

The Veterans Administration is at 2033 M Street, N.W., Washington, D.C. 20421.

Alumni Associations

THE GENERAL ALUMNI ASSOCIATION

THE OBJECTIVES OF THIS ASSOCIATION are to unite the graduates who wish to associate themselves for charitable, educational, literary, and scientific purposes, and to promote the general welfare of the University.

Eligible members are those who have matriculated in any school of the University and who have left the University in good standing, or any person who is or has been a member of the teaching, research, or administrative staff of the University, or of the Board of Trustees of the University. Active members are those eligible members who are current contributors (dues or otherwise) to or life members of The George Washington University General Alumni Association, the Alumni Association of any school of the University, or contributors to the Annual Support Program.

The Alumni Office is in Bacon Hall, 2000 H Street, N.W., Washington, D.C. 20006.

All alumni are urged to keep the Alumni Office informed of changes of address or occupation and to supply information with regard to their fellow alumni.

THE ENGINEER ALUMNI ASSOCIATION OF THE GEORGE WASHINGTON UNIVERSITY, INC.

The Engineer Alumni Association was organized in 1936 and incorporated in 1963 to coordinate with the General Alumni Association those activities of primary interest to the engineering alumnus. The objectives of the Association are to provide the link between the graduates and Faculty of the School, to help promote the general welfare of the School of Engineering and Applied Science and of the University, to foster activities of the engineering organizations recognized by the University, and to advance the engineering profession in general.

Since 1966 the Association has been governed by a board of directors comprised of 15 elected members of the Association plus the Engineers' representatives serving on the governing board of the General Alumni Association. Five members of the Association are elected each year, prior to the June meeting, to three-year board memberships as listed below:

Term Expiring 1970

Rolph Albert
 Matthew Flato
 Harvey J. Flatt
 William H. Holt
 John L. Wolfgang, Jr.

Term Expiring 1971

Solomon Fineblum
 Raymond P. Morales
 Arthur E. Proctor
 Edwin O. Stengard
 Edward A. Wareham III

Term Expiring 1972

Francis J. Hughes
 Douglas L. Jones
 John R. Manning
 Delmer C. Ports
 Elmer W. Whitlock, Jr.

General Alumni Association Representatives

Laurence R. Brown
 William J. Ellenberger

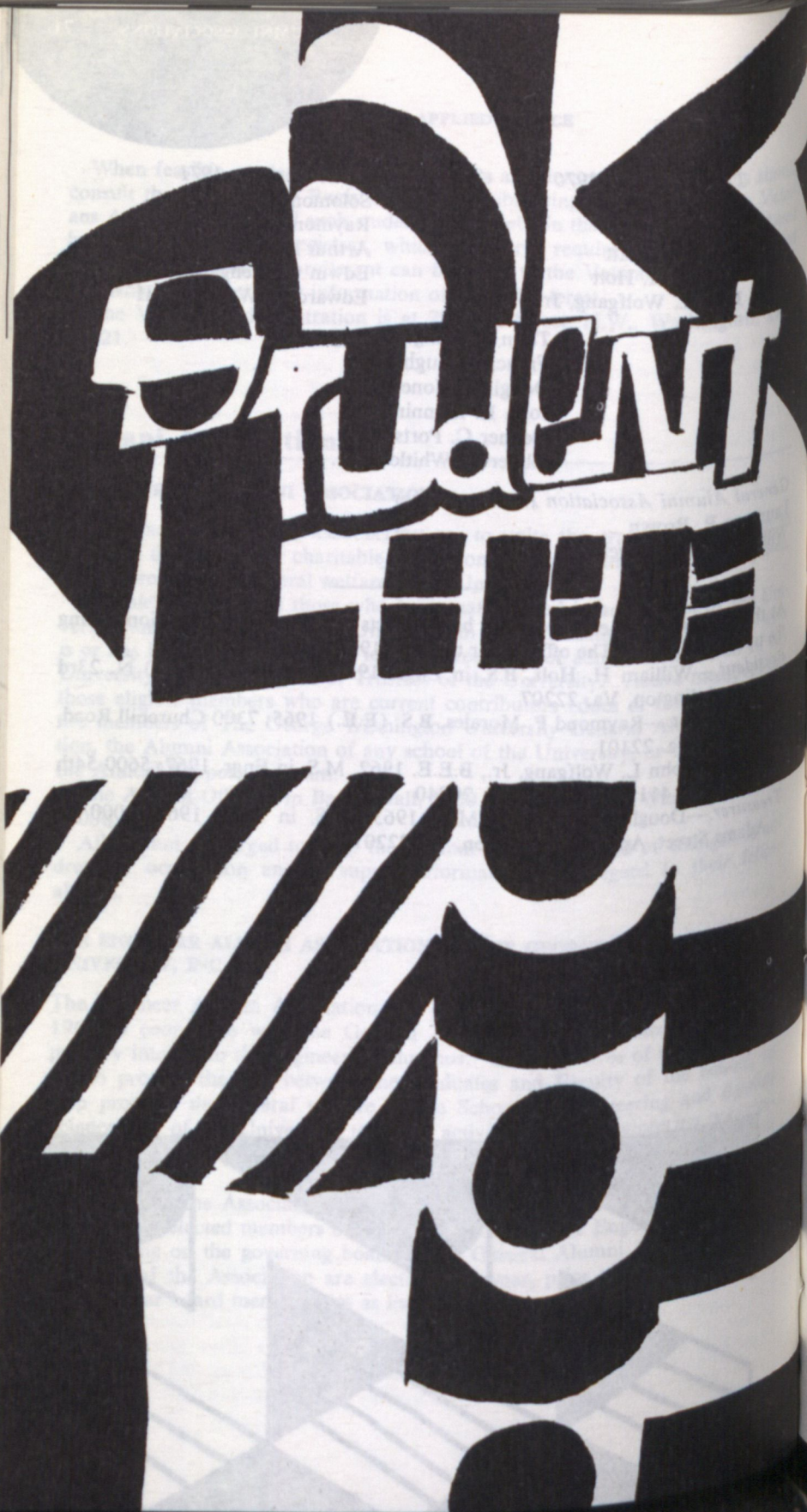
At the June meeting each year the board elects officers for its operation during the upcoming year. The officers for the year 1969-70:

President.—William H. Holt, B.S. in Engr. 1957, LL.B. 1961; 4300 N. 23rd Road, Arlington, Va. 22207

Vice President.—Raymond P. Morales, B.S. (E.E.) 1965; 7300 Churchill Road, McLean, Va. 22101

Secretary.—John L. Wolfgang, Jr., B.E.E. 1962, M.S. in Engr. 1967; 5600 54th Road, Apt. 411, Riverdale, Md. 20840

Treasurer.—Douglas L. Jones, B.M.E. 1963, M.S. in Engr. 1965; 2000 N. Adams Street, Apt. 232, Arlington, Va. 22201



STUDENT LIFE

THE OFFICE OF THE VICE PRESIDENT FOR STUDENT AFFAIRS develops Student Life programs, policies, and procedures to complement the University's formal instruction program. These activities are implemented through the offices of the Associate Deans of Students, Health Services, International Students, Psychological Clinic, Student and Alumni Career Services, Student Activities, residence halls, and the University Center.

STUDENT SERVICES

RESIDENCE HALLS

Complete information concerning the University's residence halls is available from the Housing Administrator, George Washington University, Washington, D.C. 20006. Information concerning off-campus housing near the University may be obtained at this Office. The reservation of rooms in private houses must be made by students.

Admission to the University does not include a room reservation. The student will receive, with his notification of acceptance, University residence hall information, an application for residence hall space, a medical examination form, and a declaration of intent to attend the University. The medical examination form must be completed by the applicant and his physician and returned to the University Health Services Office. The application for residence hall space must be accompanied by a \$100 *nonrefundable deposit* (\$200 for applicants admitted by early decision). Early decision students *must* submit the deposit by January 15. The housing deposit is credited toward the second semester room charge. Rooms are leased for the academic year, and payment must be made in advance of each semester.

1970-71 Residence Hall Rates per Person for Two Semesters*

For Men:	Room and Food Service	Room Only
Adams Hall		
double room.....	\$1,220	\$650
triple room.....	1,170	600

* Prices shown and utilization of Halls are subject to change.

	Room and Food Service	Room Only
For Men:		
Calhoun Hall		
double room.....	1,170	600
triple room.....	1,120	550
Madison Hall (graduate and professional students)		
double room	1,220	650
Mitchell Hall—single room.....	1,270	700
Welling Hall		
single room.....	1,220	650
double room.....	1,120	550
For Women:		
Crawford Hall (upperclass women)—double room.....	1,170	600
Graduate Women's Hall—apartment for three.....	1,270	700
Strong Hall (upperclass women)		
single room.....	1,270	700
double room.....	1,220	650
Thurston Hall		
double room, triple room, large suite for four.....	1,220	
smaller suite for four, suite for six.....	1,170	

FOOD SERVICE

Residents of Thurston Hall and all resident freshman men are required to participate in the food service plan. The plan is optional for all other residents. Well-balanced meals are served cafeteria style seven days a week (20 meals). Food service payment does not cover University holidays or vacation periods. All meal cards admit to the dining rooms in Thurston Hall and Mitchell Hall. Residents of Calhoun, Crawford, Madison, Strong, and Welling Halls are given preference for the use of the dining room in the University Center.

UNIVERSITY CENTER

The term University Center encompasses a building, an organization, and a program. The building is the University's center for community life. It is the physical instrument for implementation of the programs and objectives of the organization.

The organization, composed of students, faculty, administrators, and alumni, provides an informal education medium for individual and group activities adapted to the leisure-time interests and needs of the college community. It also provides training for those directly involved in management and programming for the Center.

The primary purpose of the George Washington University Center is the continuing development of a broad cultural, intellectual, social, and recreational program. Its secondary purpose is the provision of its various services and facilities to the campus community for the development of community life.

The Center houses a wide range of facilities to serve the needs of the campus, including dining rooms and a rathskeller, a bookstore, lounges and study areas, a theater, bowling lanes and a billiard room, a faculty club, student organization offices and workrooms, meeting and conference rooms, an information center, music listening rooms, social areas, shower and dressing rooms, lockers, and parking accommodations.

HEALTH SERVICES

The Health Services Staff assists students with their medical needs by advice and treatment, by proper referral when necessary, and by cooperation with other physicians. For medical emergencies and health consultations there is, on the campus, a Student Health Clinic open Monday through Friday, from 9 a.m. to 10 p.m. during the academic year and from 9 a.m. to 9 p.m. during the Summer Sessions, with physician in attendance. On Saturdays, a physician is available from 9 a.m. until 12 noon. For night and weekend emergencies, students may go to the emergency room of the University Hospital for treatment. The basic fee for this visit will be paid by the Health Services, and all other charges will be the responsibility of the student. This arrangement is for emergency care only.

Medical privileges also include hospitalization, including board and nursing, in the University Hospital for not more than one week during any twelve-month period—the necessity to be determined by the Director of Health Services*. These privileges do not include maternity benefits. All additional hospital charges for operating room, anesthetics, laboratory, X-ray, medications, or any special services must be paid by the student. Expenses incurred for examinations and treatment by specialists, such as eye refraction and provision of glasses, orthopedic examinations and application of cast or other appliance, laboratory and X-ray work, and surgical operations, must be paid by the student.

These medical benefits apply only to illness or disability incurred while currently enrolled in the University. They do not apply to illness or disability incurred between the last day of examinations for a semester or summer session and completion of registration for the next semester or summer session.

The student may, if he so desires, engage physicians and nurses of his own choice, but when he does so he will be responsible for the fees charged.

Rules: (1) the Director of Health Services is empowered to limit or deny the medical benefits when, in his discretion, a student has, by his misconduct or breach of the rules of the University, made himself ineligible; (2) the Director of Health Services has authority to determine the necessity and length of hospitalization; (3) a student not currently enrolled or one who has severed his connection with the University is ineligible for medical benefits; (4) a student intending to train for an athletic team is required to pass a thorough examination; (5) the hospitalization privilege provided by the University is not available to those students covered by any other type of hospitalization.

The University is not responsible for injuries received in intercollegiate or intramural games, or in any of the activities of the departments of Physical Education.

HEALTH AND ACCIDENT INSURANCE

In addition to the above services, the Health Services Staff has arranged for Health and Accident Insurance, on an elective basis, for all full-time students. Arrangements for insurance coverage are the responsibility of the student, and must be made during the fall or spring registration period. Payment must be made at the time the student subscribes to the policy.

Coverage is effective, whether at the University, at home, or elsewhere, for the entire six-month period of the policy—September through February for

* See rule (5) for exception.

those subscribing in the fall, March through August for those subscribing in the spring.

This policy contract is between the individual student and the insurance carrier and is accepted at any hospital or emergency room that accepts this type of medical work. Details of the policy are contained in a folder available at the Health Services Office.

PSYCHOLOGICAL CLINIC

The George Washington University Psychological Clinic offers services which are available primarily to students enrolled in the University and secondarily to high school students and to adults in the community. The latter are selected by the Clinic in accordance with training and research interests of the Clinic Staff.

The services are designed to assist individuals in the evaluation of their educational, personal, and social lives; diagnose academic difficulties and provide remedial measures such as study habits instruction and programmed instruction; and refer individuals to qualified agencies for assistance with problems not handled by the Clinic. Behavior therapy, individual and group psychotherapy, and individual and group counseling are available.

The Clinic also provides special assessments including: diagnostic measures prescribed by the School of Engineering and Applied Science, admissions tests for the University and for other selected educational institutions, and some selected assessments for business and industry.

Fees.—For students who are currently registered as degree candidates in the University, the fee is \$20; for students currently enrolled in the University but not as degree candidates, the fee is \$60; for graduates of the University, \$60; for community clients, \$85. Fees for specialized testing are dependent upon the services involved. All fees are payable at the Office of the Clinic.

INTERNATIONAL STUDENTS

International House is the campus center for students from foreign countries. It serves also as the headquarters of the International Students' Society which seeks to promote international friendship and understanding by welcoming to its membership students from all countries, including those from the United States.

The Adviser to International Students has his Office in International House and is available for consultation each day throughout the school week.

STUDENT AND ALUMNI CAREER SERVICES OFFICE

The Student and Alumni Career Services Office provides assistance to degree-seeking students and alumni seeking full-time, part-time, temporary, or permanent employment. The Office maintains a registry of positions available in many fields, both locally and nationally, and refers qualified applicants for consideration. The Office administers the On-Campus Industrial and Government Recruitment Interview Program for seniors and graduate students, in which private companies, government agencies, service organizations, public school systems, and universities participate. The Office also handles the referral and placement functions of the on-campus College Work-Study Program.

Prospective teachers may establish permanent credentials files in the Student and Alumni Career Services Office. This service includes files for alumni seeking college and university faculty and administrative positions. The Office also provides individual counseling for students and alumni wishing career guidance.

RELIGIOUS LIFE

The University recognizes the contribution that religion makes to the life of its students and encourages them to participate in the various religious organizations of their own choice. Catholic, Jewish, and Protestant bodies sponsor various groups and form a link between the University and the religious community. The advisers of the religious organizations are available for counseling.

Religious services in various traditions are provided regularly for the University community as announced.

INTER-FAITH FORUM

At a weekly luncheon, a discussion is led by faculty and students who are asked to speak and participate in open discussion on topics concerning religious, social, and moral issues. The discussions are held Wednesdays from 12 noon to 1 p.m. Schedules are obtainable at the Religious Activities Office.

DAVIS-HODGKINS HOUSE

The Davis-Hodgkins House is the student center of the School, providing lounges, reading rooms, and student organization offices. The House provides convenient, comfortable facilities for the exchange of ideas and good fellowship.

STUDENT ACTIVITIES

The offices of the Vice President for Student Affairs, the Associate Deans of Students, and the Director of the University Center are responsible for all co-curricular phases of student life, such as student activities, social life, and housing.

STUDENT ACTIVITIES OFFICE

The Student Activities Office is a part of the Office of the Vice President for Student Affairs. It serves as a clearing house and a coordination center for all co-curricular student activities. The staff assists student organizations in utilization of University resources, leadership training, service projects, and general programming. The Office also serves as a central information agency where past and present records and rosters of all campus organizations are filed and available to the student body. Students interested in participating in these phases of University life should acquaint themselves with the facilities and functions of this Office.

STUDENT GOVERNMENT

Student Assembly.—The University believes in encouraging the development of responsibility in students by delegating to them considerable authority in the management of student activities. To this end, the organization of the Univer-

sity includes the Student Assembly, which, with the advice of the Coordinators of Student Activities, is responsible for the conduct of all student activities. The Student Assembly is elected annually by the student body.

Committee on Student Life.—A major function of the Committee on Student Life is to review acts of the Student Assembly or of any other group engaged in extracurricular activities.

A second function is advisory. The Committee may offer recommendations to the Student Assembly on which the Assembly must act at its next regular meeting. It may also make recommendations to the President of the University at his request or on its own initiative.

Despite its broad powers, the Committee acts only when it believes that a vital interest of the University has been overlooked. The Committee, appointed annually by the President, is composed of 13 members, at least 6 of whom are students and at least 6 faculty members.

Hearing Committee on Student Affairs.—The University Hearing Committee on Student Affairs hears and decides all cases arising under the rules and regulations of the University governing student conduct. It also hears and decides cases arising under the rules and regulations of student governmental bodies and student organizations. Its decisions take the form of advice to the President of the University as to what action may be deemed appropriate in such cases.

The Hearing Committee has appellate jurisdiction in all cases first heard before the Student Assembly or the Interfraternity or Panhellenic councils with authority to reverse the findings and judicial actions taken by those bodies.

The Hearing Committee has original jurisdiction in those cases in which one or more of the aforementioned bodies is a party to the case, or whenever one of the aforementioned bodies yields its own original jurisdiction. The Committee's original jurisdiction also extends to cases arising under the Human Relations Act and under the regulations adopted by the University for the preservation of academic freedom.

Membership is comprised of 6 students and 6 members of the faculty, all appointed by the President. Meetings are held monthly. Due process is guaranteed in all cases.

ELIGIBILITY FOR STUDENT ACTIVITIES

Any student registered in the University is eligible to participate in nonathletic student activities of the University; however, a student having a scholastic average of less than 2.00 is not eligible to be:

1. A member of the Band, Cheerleaders, Committee on Student Life, Enosinian Debate Society, George Washington University Dance Company, Glee Club, Hearing Committee on Student Affairs, Interfraternity Council, Panhellenic Council, Religious Council, Residence Hall Councils, Student Assembly, or any publications staff;
2. Any officer, permanent committee chairman, or member of the executive board of any activity.

The control and administration of all student activities are outlined in *The Student Handbook*.

THE ENGINEERS' COUNCIL

The Engineers' Council is the student governing body for the School of Engineering and Applied Science, composed of elected representatives from each level class and from the graduate student body, from each student organization in the School, the Business Manager of the *Mecheleciv*, and the House Manager of the Davis-Hodgkins House. The purpose of the Council is to provide liaison between the student body of the School and the Faculty, Administration, and Student Government of the University in all matters affecting the general interests and welfare of the student body, the School, or the University. The Council is maintained financially by the Engineers' Council Fee paid by each student in the School, and sponsors the engineers' student magazine, *Mecheleciv*; the Engineers' Mixers; Engineers' Ball; and the Annual Christmas Tree Ceremony in the University Yard. Council meetings are open to all students in the School.

The Council acts as the directing body for *Mecheleciv*, which is published six times a year and is free to all students in the School. This magazine includes campus and alumni news, a calendar of events, news of the student organizations, and articles on engineering by students and faculty members. The magazine is published by a student Board of Editors and a volunteer student staff.

SPORTS

The University is a member of the National Collegiate Athletic Association. Its teams participate in intercollegiate contests in basketball, baseball, tennis, golf, rifle, soccer, and crew.

The University offers a broad program of extramural and intramural sports activities for both men and women through the Department of Physical Education.

PERFORMING ARTS

Students may participate in dance, drama, forensics, music, and radio broadcasting through the following organizations: Enosinian Debating Society; George Washington University Dance Company; Station WRGW; University Chamber Choir, Chorus, Orchestra; and University Players. Each of these groups presents programs during the academic year.

With the cooperation of the Curator of Art, an annual student art exhibit is presented.

ANNUAL EVENTS

Recreation Program.—The Student Assembly and the Department of Physical Education arrange dances, movies, and trips at frequent intervals for all students.

Concert Program.—The Student Assembly sponsors a concert each semester at which nationally known entertainers perform.

Orchestra Series.—The University Orchestra offers a series of concerts throughout the academic year.

University Concert Series.—Offered by the Department of Music throughout the academic year.

Art Exhibits.—The work of locally, nationally, and internationally known artists is shown in monthly exhibits in the George Washington University Art Gallery in Lisner Auditorium.

Engineers' Mixers.—At the beginning of each semester the Engineers' Council sponsors a program of orientation, good fellowship, and entertainment to introduce new students.

Engineers' Week.—Sponsored by the Engineers' Council to acquaint high school students and their parents with the School of Engineering and Applied Science.

Homecoming.—Scheduled about the middle of the fall semester, Homecoming is the primary festive period of the school year. It includes University theater productions and other activities.

Religion in Life Program.—Special emphasis is given to the place of religion in contemporary society in this program of events during the fall and spring semesters.

Holiday Season.—The University traditionally greets the holiday season with appropriate ceremonies including the lighting of the Christmas tree (given and decorated by the students of the School of Engineering and Applied Science), the singing of Christmas music, and service projects.

Engineers' Ball.—The Engineers' Council sponsors the Engineers' Ball, a social event for students and alumni.

May Day.—This is the traditional time for the award of honors in student activities. Mortar Board and Omicron Delta Kappa announce and present their new members.

STUDENT ORGANIZATIONS

HONOR SOCIETIES

Sigma Xi.—A national scientific honor society, the purpose of which is to encourage original investigation in science, pure and applied. Outstanding graduate students in the sciences are eligible for full membership, and undergraduates who have shown marked ability in research may be elected to associate membership.

Alpha Lambda Delta.—A national fraternity established to encourage and reward high scholarship and attainment, membership in which is limited to those freshman women who attain a scholastic average of at least 3.50.

Delphi.—An intersorority honorary society.

Delta Sigma Rho-Tau Kappa Alpha.—A national forensic society.

Gate and Key.—An intrafraternity honorary society.

Mortar Board.—A national society for senior college women, stressing leadership, scholarship, and service.

Omicron Delta Kappa.—A national fraternity emphasizing leadership in extracurricular activities.

Order of Scarlet.—A service honorary society for sophomore and junior men.

Phi Eta Sigma.—A national fraternity, established to encourage and reward high scholarship and attainment, membership in which is limited to those freshman men who attain a scholastic average of at least 3.50.

Sigma Tau.—A national engineering honorary fraternity, the purpose of which is to recognize scholarship and professional attainment.

Tassels.—A service honorary society for sophomore women.

Tau Beta Pi.—A national engineering honorary fraternity, the purpose of which is to recognize distinguished scholarship and exemplary character.

PROFESSIONAL ORGANIZATIONS

American Society of Civil Engineers (Student Chapter).

American Society of Mechanical Engineers (Student Chapter).

Institute of Electrical and Electronic Engineers (Student Chapter).

Society for the Advancement of Management.—Membership limited to students in engineering and public or business administration.

Theta Tau (Gamma Beta Chapter).—A national professional (engineering) fraternity. Membership by invitation to outstanding students who have completed successfully at least the first year in the School of Engineering and Applied Science.

SOCIAL FRATERNITIES

Alpha Epsilon Pi, Delta Tau Delta, Kappa Sigma, Phi Sigma Delta, Phi Sigma Kappa, Sigma Alpha Epsilon, Sigma Alpha Mu, Sigma Chi, Sigma Nu, Sigma Phi Epsilon, Tau Epsilon Phi, Tau Kappa Epsilon.

SOCIAL SORORITIES

Alpha Epsilon Phi, Chi Omega, Delta Gamma, Delta Phi Epsilon, Kappa Alpha Theta, Kappa Kappa Gamma, Phi Sigma Sigma, Pi Beta Phi, Sigma Delta Tau.

STUDENT PUBLICATIONS

The Cherry Tree (the annual), *The University Hatchet* (semi-weekly newspaper), *Mecheleciv* (engineers' publication), *The Potomac* (literary magazine).

RELIGIOUS ORGANIZATIONS

Baptist Student Union, B'nai B'rith Hillel Foundation, Christian Science Organization, Eastern Orthodox Club, Episcopal Student Association, Lutheran Student Association, Newman Club, Unitarian-Universalist Club, United Christian Fellowship, Wesley Foundation, and a Religious Council comprised of representatives of all religious organizations.

OTHER ORGANIZATIONS

Alpha Phi Omega (national service fraternity), Alpha Theta Nu (scholarship winners), Big Sisters, Black Students' Union, Cheerleaders, Colonial Boosters, Foggy Bottom Sports Car Club, Free University, George Washington Action Council, Interfraternity Council, International Students' Society, Intersorority Athletic Board, Junior Panhellenic Association, Model Government Association, Old Men, People-to-People, Residence Hall Councils, Senior Panhellenic Association, Station WRGW, Student Assembly, Student Grotto of the National Speleological Society, Students for Better Government, Students for a Democratic Society, University Commuter Association, University Pep Band, Young Democrats Club, Young Republican Club.

FACTS ABOUT GEORGE WASHINGTON UNIVERSITY

<i>General Information</i>	Private, Nonsectarian, Coeducational, Founded 1821
<i>Location</i>	Washington, D.C., bounded by Pennsylvania Avenue and 19th, F, and 24th Streets, N.W.
<i>Number of Students</i>	14,556 (9,438 men, 5,118 women)
<i>Number of Undergraduates</i>	5,487 (2,739 men, 2,748 women)
<i>Geographical Origin of Students</i>	50 states, District of Columbia, 92 countries; 20% are from the Washington area
<i>Number of Full-time Faculty</i>	722 (73% with Doctoral degrees)
<i>Number of Part-time Faculty</i>	327 (includes some of the most distinguished men in Washington who serve as professorial lecturers)
<i>Residence Hall Space</i>	2,212 (an additional 1,500 students reside in fraternity houses, rooms, and apartments on or near the campus)
<i>Room and Board</i>	Cost varies from \$1,120 to \$1,270 for the academic year (see pages 73-74)
<i>Campus Organizations</i>	145

Undergraduate majors: Accounting, American Civilization, Anthropology, Applied Statistics, Art History and Theory, Biology, Botany, Business Administration, Business and Economic Statistics, Chemistry, Chinese Studies, Civil Engineering, Classical Archeology and Greek, Classical Humanities, Dramatic Art, Economics, Electrical Engineering, Elementary Education, Fine Arts, French Language and Literature, Geography, Geology, Germanic Languages and Literatures, History, International Affairs, International Business, Journalism, Latin, Latin American Studies, Literature (English, American), Mathematical Statistics, Mathematics, Measurement Science, Mechanical Engineering, Medical Technology, Music (Applied History and Literature, Theory), Philosophy, Physical Education, Physics, Political Science, Premedicine, Psychology, Public Affairs, Religion, Russian Language and Literature, Secondary Education, Sociology, Spanish American Literature, Spanish Language and Literature, Speech Communication, Speech Pathology and Audiology, Zoology.

Study leading to graduate or professional degrees is offered in the Graduate School of Arts and Sciences, the National Law Center, the School of Medicine, the School of Engineering and Applied Science, the School of Education, the School of Government and Business Administration, and the School of Public and International Affairs.

THE UNIVERSITY

HISTORY AND ORGANIZATION

THE GEORGE WASHINGTON UNIVERSITY had its beginning in 1821 as The Columbian College in the District of Columbia. The name of the institution was changed in 1873 to Columbian University and in 1904 to The George Washington University. The debt of the University to George Washington whose name it bears is an intangible one.

George Washington, as President and as private citizen, had urgently insisted upon the establishment of a National University in the Federal City. There he hoped that, while being instructed in the arts and sciences, students from all parts of the country would acquire the habits of good citizenship, throwing off local prejudices and gaining at first hand a knowledge of the practice, as well as the theory, of republican government. To further the materialization of his hopes, Washington left a bequest of fifty shares of The Potomac Company "towards the endowment of a University to be established within the limits of the District of Columbia, under the auspices of the General Government, if that government should incline to extend a fostering hand towards it." The Congress never extended "a fostering hand." The Potomac Company passed out of existence, and Washington's bequest became worthless.

Fully conscious of Washington's hopes, but motivated primarily by a great missionary urge and the need for a learned clergy, a group of dedicated ministers and laymen sponsored a movement for the establishment of a college in the District of Columbia. Inspired largely by the zeal and energy of the Reverend Luther Rice, they raised funds for the purchase of a site and petitioned Congress for a charter. After much delay and amendment, Congress granted a charter which was approved by President Monroe on February 9, 1821. To safeguard the College's nonsectarian character it provided "that persons of every religious denomination shall be capable of being elected Trustees; nor shall any person, either as President, Professor, Tutor or pupil, be refused admittance into said College, or denied any of the privileges, immunities, or advantages thereof, for or on account of his sentiments in matters of religion."

During the entire time when the institution was known as Columbian College, its activities were centered on College Hill, a tract of forty-six and a half acres between the present Fourteenth and Fifteenth Streets and extending north from Florida Avenue to somewhat beyond Columbia Road. The Medical School was located downtown. For the better part of the Columbian University period,

the buildings of the University were situated along H Street between Thirteenth and Fifteenth Streets. The Medical School group still remains there.

During the last half century the University's present plant has been developed in that section of the old First Ward familiarly known as "Foggy Bottom," between Nineteenth and Twenty-fourth Streets, south of Pennsylvania Avenue. Within a few squares are the White House, the Department of the Interior, the State Department, the World Bank, and many other government offices and international agencies. The area is not without its reminders of historic interest to the University. President Monroe, who signed the Charter, lived at 2017 Eye Street. The first President of the Board of Trustees, the Reverend Obadiah B. Brown, was for fifty years the pastor of a church at Nineteenth and Eye Streets, and Washington selected Twenty-third and E Streets as the site of the National University he hoped to see established.

The University as it is now organized consists of Columbian College of Arts and Sciences (undergraduate); the Graduate School of Arts and Sciences; the professional schools, which include the National Law Center and the schools of Medicine, Engineering and Applied Science, Education, Government and Business Administration, and Public and International Affairs; the College of General Studies; the Division of University Students; and the Summer Sessions.

The George Washington University is privately endowed and is governed by a self-perpetuating Board of Trustees of which the president is an ex officio member.

THE UNIVERSITY LIBRARIES

The Library collections of the University are housed in the University Library, the general library of the University, and in the departmental libraries of law, medicine, the Institute for Sino-Soviet Studies, and the Department of Health Care Administration.

These collections contain 494,116 volumes and 70,878 units of microtext. Approximately 30,000 volumes a year are added to the Library's resources. Endowments, supplementing the University appropriation, provide books in the fields of American civilization, American literature, foreign service, history, public finance, and the social sciences; and gifts from many sources have enriched the collections. The Libraries currently receive 3,991 periodicals.

Information concerning the use of the Libraries may be obtained at the Library service desks.

The Library is administered for the curricular, reference, and recreational needs and interests of the students. Instruction in the use of the library is given upon request by the reference librarians. The Library endeavors to assist students and all members of the University to use the rich library resources of Washington and the unusual opportunities they offer for extensive research. Interlibrary loan arrangements are maintained with other libraries in the city and in the United States.

The student has access to the Library of Congress, the Public Library of the District of Columbia and its branches, the libraries of the Pan American Union, the Bureau of Railway Economics, the U.S. Department of Agriculture, the Smithsonian Institution, the National Library of Medicine, and many of the other great special collections of the government departments.

The hours of the University Library are Monday through Friday, 8:30 a.m. to 12 midnight; Saturday, 9 a.m. to 10 p.m.; Sunday, 1 p.m. to 12 midnight.

THE BOARD OF TRUSTEES 1969-1970

Edward Karrick Morris, LL.D., *Chairman*
 Charles Emory Phillips, LL.B., LL.M., *Vice Chairman*
 James Matlack Mitchell, M.A., *Secretary*
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 Joseph D. Hughes, B.S., J.D., LL.M., LL.D.
 Lewellyn A. Jennings
 David Matthew Kennedy, LL.B., B.A., LL.D.
 Thaddeus A. Lindner, B.A. in Govt.
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 *William Gregg White, B.S. in C.E.
 John Johnston Wilson, LL.B.
 Watson W. Wise, Ph.B.
 Stephen Russell Woodzell, B.S. in E.E.
 James Otis Wright, B.S., J.D.
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Alexander Wetmore, Ph.D., Sc.D.

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COURSES OF INSTRUCTION

THE COURSES OF INSTRUCTION in the School of Engineering and Applied Science are listed on the following pages. Courses numbered from 1 through 199 are planned for undergraduate credit, although certain courses may be taken for graduate credit when arrangements are approved in advance by the instructor and the Dean. Courses numbered 201 to 300 are planned for graduate credit and may in certain instances be taken by qualified undergraduate students. Courses numbered from 301 to 400 are primarily for doctoral students.

The number of semester hours credit given for the satisfactory completion of a course is indicated in parentheses after the name of the course. Thus, a year course giving three hours of credit each semester is marked (3-3), and a semester course giving three hours credit is marked (3). A semester hour consists of the completion of one fifty-minute period of class work or of one laboratory period a week for one semester.

Students who are not candidates for degrees but who wish to take courses offered by the School of Engineering and Applied Science should apply for admission to the Division of University Students.

KEY TO ABBREVIATIONS

The following abbreviations are used in this catalogue for course designations.

Ap S	Applied Science	Engl	English
Chem	Chemistry	Geol	Geology
CE	Civil Engineering	Math	Mathematics
EE	Electrical Engineering	MeaS	Measurement Science
E Ad	Engineering Administration	ME	Mechanical Engineering
EM	Engineering Mechanics	Phys	Physics

Applied Science

Interdepartmental offerings.

UNDERGRADUATE COURSES

1-2 Engineering in Modern Society (1-1)

The role of engineering in a technological society, conventional vs. modern engineering, engineering as a profession, problem-solving approach and engineering methods. (Offered every year: academic year—day; 1970-71 and alternate years: academic year—evening)

59 Introductory Analytical Mechanics (4)

Kinematics of a particle, statics and dynamics of a particle, statics and dynamics of systems of particles, kinematics of a rigid body, geometrical and inertial parameters of rigid bodies, statics and dynamics of rigid bodies, introduction to Lagrangian-Hamiltonian formulation. Prerequisite: Phys 31. Prerequisite or concurrent registration: Ap S 113. (Fall)

113 Engineering Analysis I (3)

Analytical methods appropriate to the solution of engineering problems. Mathematical topics include ordinary differential equations, vector calculus, and integral theorems; elements of matrices; complex algebra. Prerequisite: Math 32. (Fall)

114 Engineering Analysis II (3)

Analytical methods appropriate to the solution of engineering problems. Mathematical topics include Bessel functions, Legendre polynomials, Fourier series and integrals, Laplace transform, introduction to partial differential equations and boundary value problems. Prerequisite: Ap S 113. (Spring)

GRADUATE COURSES**211 Mathematical Methods in Applied Science I (3)**

Functions of complex variables and integral transforms: analytic function theory including contour integration and conformal mapping; elements of Fourier and Laplace transforms, special functions, Mellin and Hankel transforms, saddle point methods. Prerequisite: approval of Department. (Fall and spring)

212 Mathematical Methods in Applied Science II (3)

Linear vector spaces, linear transformations and matrices, tensors: Euclidean and unitary vector spaces, analogies with series expansion of arbitrary functions in function space, linear operators and matrices, characteristic value problem, bilinear forms, convex sets; tensor algebra; covariant differentiation, Riemann-Christoffel tensor, curvilinear coordinates. Prerequisite: approval of Department. (Fall)

213 Mathematical Methods in Applied Science III (3)

Partial differential equations and boundary value problems: first-order and linear second-order equations; solutions of the wave, Helmholtz, Laplace, Poisson, and diffusion equations and associated boundary value problems using separation of variables, integral transform, and Green's function methods. Prerequisite: Ap S 211 (which may be taken concurrently) or permission of instructor. (Fall)

214 Mathematical Methods in Applied Science IV (3)

Calculus of variations and linear integral equations: Euler's equation and generalizations, constraints, Sturm-Liouville problems, eigenvalues and eigenfunctions by variational methods, eigenfunction expansions, bounds; integral transforms as integral equations of the first kind, Fredholm and Volterra equations, Fredholm and Hilbert-Schmidt theories, singular integral equations. Prerequisite: Ap S 211 (which may be taken concurrently) or permission of instructor. (Spring)

215 Mathematical Methods in Applied Science V (3)

Perturbation methods in engineering: nonlinear ordinary differential equations, topological and classical methods of solution, asymptotic series, boundary layer solutions; nonlinear partial differential equations, boundary layer solutions which include singular initial value and boundary value problems. Prerequisite: Ap S 213. (1971-72 and alternate years: spring)

Electrical Engineering*

Professors R.B. Heller, T.J. Carroll (*Research*), Guenther Hintze (*Research*), R.S. Ledley (*Research*), W.K. Kahn
 Adjunct Professor Charles Feldman
 Professorial Lecturer W.F. Crosswell
 Associate Professors E.H. Braun, Marvin Eisenberg, A.C. Meltzer (*Acting Chairman*)
 Adjunct Associate Professor P.H. Sawitz
 Associate Professorial Lecturers M.E. Brady, S.J. Raff, C.L. Fricke
 Assistant Professors Nicholas Kyriakopoulos, N.A. Sloan, Vallobh Vimolvanich, Abd-elfattah Abd-alla, J.S. Huang
 Assistant Professorial Lecturers D.O. Baechler, D.C. Rohlfis, J.K. Cooper, W.H. Fuhr, M.D. Aldrich, Constantine Balanis, M.M. Bruce, Maurice Morin, M.I. Celebiler, F.S. LeBeau, J.H. O'Hara, J.J. Rocchio, Jr., Bhupendraprasad Shah, Paul Willis, George Saxton

UNDERGRADUATE FIELD

Electrical Engineering (see pages 26-28).

SUBJECT AREAS—UNDERGRADUATE

Faculty in charge of each subject area are listed in parentheses.

Networks

(Huang Kyriakopoulos, Meltzer)

- 11-12 Linear Networks I, II
- 113 Network Analysis and Design
- 114 Linear Active Networks

Electronics

(Eisenberg, Heller)

- 20 Introductory Engineering Electronics
- 121 Engineering Electronics and Design
- 122 Pulse and Waveshaping Electronic Design

Fields and Waves

(Braun, Carroll, Heller, Kahn)

- 31-32 Fields and Waves I, II
- 133 Electromagnetic Waves

Communications

(Braun, Sawitz)

- 143-44 Elements of Communication Engineering I, II

* Staff of instruction for the academic year 1969-70.

Computer Science

(Abd-alla, Kyriakopoulos, Ledley, Meltzer)

- 51 Applications of Computers
- 152 Introduction to Digital Computers
- 153 Design of Switching Systems
- 154 Digital Computer Design
- 155 Introduction to Numerical Methods
- 156 Introduction to System Programming
- 157 Machine and Assembly Language Programming
- 158 Algorithmic Methods and High-level Languages

Laboratories and Measurement

(Abd-alla, Eisenberg)

- 60-61 Introductory Electrical Engineering Laboratory I, II
- 160 Electrical Measurements
- 161-62 Electrical Engineering Laboratory

Controls and Systems

(Hintze, Vimolvanich)

- 172 Control Systems
- 177 Electrical Energy Conversion

Medical Engineering

(Eisenberg, Ledley)

- 184 Introduction to Medical Engineering

FIELDS AND AREAS OF CONCENTRATION—GRADUATE

Faculty in charge of each field or area of concentration are listed in parentheses.

Networks

(Huang, Kyriakopoulos, Meltzer)

- 211-12 Advanced Network Analysis I, II
- 215-16 Linear Network Synthesis I, II
- 319 Networks Research

Electronics

(Braun, Heller, Kahn)

- 221-22 Physical Electronics I, II
- 225 Nonlinear Electronics
- 226 Optical Electronics
- 227 Industrial Electronics
- 228 High-frequency Electronics
- 329 Electronics Research

Fields and Waves

(Braun, Carroll, Heller, Kahn)

- 230 Magnetohydrodynamics
- 231 Field Analysis and Potential Theory
- 232 Electrodynamics
- 233 Microwaves and Components
- 234 Electromagnetic Wave Propagation
- 235 Antennas
- 339 Fields and Waves Research

Communications

(Braun, Sawitz)

- 241-42 Information Theory I, II
- 243-44 Communication Theory I, II
- 246 Digital Communications
- 247 Communication Systems
- 248 Microwave Communication Systems
- 277 Space Communication Systems
- 349 Communications Research

Computer Science

(Abd-alla, Kyriakopoulos, Ledley, Meltzer)

- 250 Application of Numerical Methods
- 251 Computing Systems
- 252 Information Retrieval Systems
- 253 Finite State Machines
- 254 Finite Automata
- 255 Pattern Recognition, Graphics and Optical Processing
- 256 Analog and Hybrid Computers
- 257 Digital Computer Programming Systems
- 258 Design of Compilers and High-level Languages
- 259 Systems Programming
- 359 Computer Science Research

Controls and Systems

(Hintze, Vimolvanich)

- 271 Automatic Control in State Space Setting
- 272 Digital Control Systems
- 273 Optimal Programming and Control
- 275 Stochastic Processes in Automatic Control
- 276 Cybernetics
- 278 Spacecraft Systems Design
- 371 Simulation Methods for System Analysis
- 372 Analysis and Control of Large Systems
- 379 Controls and Systems Research

Medical Engineering

(Eisenberg, Ledley)

- 281 Electronic Measurements in Medicine
- 282 Instrumentation in Medical Electronics
- 283-84 Introduction to Medicine for Engineers I, II
- 285 Engineering in Vocational Medicine and Rehabilitation
- 389 Medical Engineering Research

UNDERGRADUATE COURSES**11 Linear Networks I (3)**

Circuit concepts, elements, and parameters; network conventions and equations: mesh and node analysis; network solutions using differential equations and initial conditions; transient and steady-state response; impedance concepts; energy and power; resonance. Prerequisite: Ap S 113, Phys 32. (Fall—day and evening)

12 Linear Networks II (3)

Singular functions; Laplace transform; network functions, poles and zeros; total response; time and frequency domains; convolution theorems; Fourier analysis, spectra; frequency response, Bode plots; two-port parameters. Prerequisite: Ap S 114, EE 11. (Offered every year: spring—day; 1970-71 and alternate years: spring—evening)

20 Introductory Engineering Electronics (3)

Various types of devices used in electronic engineering considered from the point of view of the physics of their operation and from the engineering point of view of their application to electronic circuits. Solid-state, vacuum, and gaseous devices. Primary emphasis on application of these elements in power supplies and in linear amplifiers. Introduction of design concepts through use of graphical techniques. Prerequisite: EE 11. (Spring—day and evening)

31 Fields and Waves I (3)

Vector calculus, orthogonal coordinate systems, Laplace and Poisson's diffusion and wave equations, scalar and vector potentials, Maxwell's equations, boundary value problems. Prerequisite: Phys 32. Prerequisite or concurrent registration: Ap S 114. (Offered every year: fall—day; 1970-71 and alternate years: fall—evening)

32 Fields and Waves II (3)

Conformal transformations, method of images, one-dimensional waves, transmission lines, use of Smith Chart, waves in solids and fluids. Prerequisite: EE 31. (Offered every year: spring—day; 1970-71 and alternate years: spring—evening)

51 Applications of Computers (3)

Solution of problems on digital computers, using machine language, FORTRAN, data processing, and numerical methods. Writing, debugging, and running programs on a digital computer. (Fall—day and evening)

60 Introductory Electrical Engineering Laboratory I (2)

(This course, together with EE 61, replaces former EE 62 (3))

Use, theory of design, and application of standard electronic laboratory equipment; applications of instrumentation through experiments in basic network theorems; measurement of electrical quantities and characteristics of electrical devices. Prerequisite or concurrent registration: EE 11, 31. (Offered every year: fall—day; 1971-72 and alternate years: fall—evening)

61 Introductory Electrical Engineering Laboratory II (2)

(This course, together with EE 60, replaces former EE 62 (3))

Characteristics of electronic devices and circuits; design of electronic amplifiers and measurement of their properties; experiments in support of courses in networks, fields, and electronics. Prerequisite or concurrent registration: EE 12, 20, 60. (Offered every year: spring—day; 1971-72 and alternate years: spring—evening)

113 Network Analysis and Design (3)

Application of matrices and linear graphs to electrical networks; trees, circuits, cut-sets; network equations; signal-flow graphs; introduction to state-space techniques; computer solutions; network transfer functions; properties and synthesis of two-element, one-port networks; filter theory and design; computer-aided circuit design. Prerequisite: EE 12, 20. (Offered every year: fall—day; 1970-71 and alternate years: fall—evening)

114 Linear Active Networks (3)

Description of networks by terminal and port concepts; power and scattering parameters; analysis of active networks, including negative impedance converters, gyrators, etc.; interconnection of networks; properties of active networks, including reciprocity, stability, activity, and feedback. Prerequisite: EE 113. May be taken for graduate credit. (Spring—day and evening)

121 Engineering Electronics and Design (3)

Graphical analysis and design beyond the level covered in Electrical Engineering 20. Introduction of incremental analysis and design methods to electronic circuits; use of equivalent circuits; amplifiers, oscillators, modulation, and demodulation. Prerequisite: EE 20. (Offered every year: fall—day; 1970-71 and alternate years: fall—evening)

122 Pulse and Waveshaping Electronic Design (3)

Introduction to and design of the type of nonlinear circuits used in modern day computer and communications systems. Pulse, sweep, switching, and logic circuits; counting and timing circuits. Prerequisite: EE 121. (Offered every year: spring—day; 1970-71 and alternate years: spring—evening)

133 Electromagnetic Waves (3)

Characteristics of common wave-guides, miscellaneous wave-guiding systems; wave propagation in anisotropic media, resonant cavities; n-port

wave-guide junctions; the long straight dipole antenna; linear antenna arrays; arrays of arrays. Prerequisite: EE 32. May be taken for graduate credit. (Fall—day and evening)

143 Elements of Communication Engineering I (3)

Fourier series and transforms; power spectra and correlation; principles of modulation; amplitude, angle, and pulse modulation; modulation and demodulation systems; time and frequency division multiplexing. Prerequisite or concurrent registration: EE 113, 121. (Offered every year: fall—day; 1971–72 and alternate years: fall—evening)

144 Elements of Communication Engineering II (3)

Introduction to the statistical theory of communication, random signals and noise, concepts of information theory, transmission of information over noisy channels, comparison of modulation systems in the presence of noise. Prerequisite: EE 143. (Offered every year: spring—day; 1971–72 and alternate years: spring—evening)

152 Introduction to Digital Computers (3)

Introduction to the use and structure of digital computers, addressing methods, data processing, and machine language programming; Boolean algebra and introduction to the design of combinational switching circuits; number systems and arithmetic in digital machines; machine subsystems and their interconnections; use of software systems and software-hardware relationships. Prerequisite: EE 51 or permission of instructor. (Offered every year: spring—day; 1970–71 and alternate years: spring—evening)

153 Design of Switching Systems (3)

Switching algebra and Boolean logic; analysis and design of switching devices; design of combinational and sequential logic networks; minimization techniques and their use in logic design; electronic implementation of logic; number systems and codes, geometric interpretation, error-correcting codes; encoding and decoding; logic and electronic design of functional digital units. Prerequisite: EE 152 or permission of instructor. May be taken for graduate credit. (Fall—day and evening)

154 Digital Computer Design (3)

Logic and electronic design of functional digital units, design of computer subsystems, flow of information and logical flow diagrams in timing and control; design of memory, arithmetic, and I/O units; binary and decimal machine arithmetic; design of a digital computer. Prerequisite or concurrent registration: EE 153 or permission of instructor. May be taken for graduate credit. (Spring—day and evening)

155 Introduction to Numerical Methods (3)

Use of numerical methods in engineering and scientific problems, concepts of algorithm and flowcharts, errors in computer and numerical methods. Introduction to numerical methods for the solution of simultaneous linear algebraic equations, roots of equations, numerical differentiation, and integration; the solution of ordinary differential equations. Statistical methods for the evaluation of experimental data and correlation techniques. Prerequisite: EE 51 or equivalent. (Offered every year: fall—day; 1971–72 and alternate years: fall—evening)

156 Introduction to System Programming (3)

Introduction to computer software and software systems; management of computer software; concepts in the use of macro-assemblers, loaders,

monitors, and executive systems; control of input-output and utility programs; recursive and reentrant programming for time-shared systems; introduction to multiprogramming and multiprocessor software systems. Prerequisite: EE 157 or permission of instructor. May be taken for graduate credit. (Offered every year: spring—day; 1971-72 and alternate years: spring—evening)

157 Machine and Assembly Language Programming (3)

Machine and assembly language programming in fixed and variable word-length computers; techniques in addressing and machine control; data structures and data processing; use of subroutine linkages; co-routines, pushdown lists, list processing, loops and input-output subroutines; use of a macro-assembly language; sorting, merging, arrays, and data fields in data processing. Prerequisite: EE 152 or equivalent, or permission of instructor. May be taken for graduate credit. (Fall—evening)

158 Algorithmic Methods and High-level Languages (3)

Introduction to high-level procedural and problem-oriented computer languages; data structures and choice of a data processing language. List processing, string processing, and introduction to information retrieval; large data bases and their use in time-shared systems; simulation languages; introduction to heuristic programming. Prerequisite: EE 51 or equivalent and permission of instructor. May be taken for graduate credit. (Spring—evening)

160 Electrical Measurements (3)

Electrical measurements, from direct current through radio frequencies; techniques; detectors; bridges; measurement of current, voltage, power, resistance, capacitance, inductance, energy, phase angle, frequency, and time; dielectric and magnetic measurements; topics in high-frequency measurement, including field strength, signal-to-noise ratio, impedance, attenuation. Prerequisite: EE 12, 20. (Spring—evening)

161-62 Electrical Engineering Laboratory (2-2)

(Replaces former EE 163-64 (3-3))

Experiments in support of courses in networks, electronics, microwaves, computers, communications, controls, and machines. The student is required to begin a design project in the first half of the course; the completion of this project is the major effort of the second half. Prerequisite or concurrent registration: EE 61, 113, 121, 152. EE 161 is prerequisite to EE 162. (Offered every year: academic year—day; 1971-72 and alternate years: academic year—evening)

172 Control Systems (3)

Analysis and design of linear feedback control systems. Applications of stability criteria, steady-state and transient analyses. Prerequisite: EE 12, 20. (Offered every year: spring—day; 1970-71 and alternate years: spring—evening)

177 Electrical Energy Conversion (3)

Fundamentals of electromechanical energy conversion. Electromechanical transducers and their equivalent circuits, three-phase and single-phase a-c rotating machines, d-c machines, rotating machines as circuit elements. Prerequisite: EE 12. (Offered every year: fall—day; 1971-72 and alternate years: fall—evening)

184 Introduction to Medical Engineering (3)

Designed to introduce the engineering or physical sciences student to the applications of engineering in the medical sciences; terminology of the medical profession emphasized; the physiology of the human body presented from overall systems or functional approach; survey of present-day medical measurements and consideration of those areas in which engineering may be applied advantageously to medicine. May be taken for graduate credit. Admission by permission of instructor. (Fall—evening)

198 Research (1 to 3)

Applied research and experimentation projects, as arranged. Prerequisite: junior or senior status. (Fall and spring—as arranged)

GRADUATE COURSES**211 Advanced Network Analysis I (3)**

Network theorems; network functions, relationship of parts of network functions; analytic properties. Fourier analysis, impulse response, convolution, numerical techniques for computer solution. Computer-aided design. Prerequisite: EE 12 or permission of instructor. (1970-71 and alternate years: fall—day; 1971-72 and alternate years: fall—evening)

212 Advanced Network Analysis II (3)

Applications of linear graphs to networks; topological analysis; formulation and solution of state-space equations; formulation for computer solution. Advanced network properties, realizability, causality, controllability, and observability concepts. Prerequisite: EE 211. (1970-71 and alternate years: spring—day; 1971-72 and alternate years: spring—evening)

215 Linear Network Synthesis I (3)

Properties and testing of positive real functions. Synthesis of LC, RL, RC one-port networks. Brune and Bott-Duffin synthesis techniques. Introduction to two-port ladder and lattice synthesis. Introduction to the approximation problem. Prerequisite: EE 12 or permission of instructor. (1970-71 and alternate years: fall—evening; 1971-72 and alternate years: fall—day)

216 Linear Network Synthesis II (3)

Advanced techniques in passive one-port and two-port synthesis. Active network synthesis using discrete and integrated components. Advanced topics in the approximation problem. Prerequisite: EE 215. (1970-71 and alternate years: spring—evening; 1971-72 and alternate years: spring—day)

221 Physical Electronics I (3)

Theoretical principles underlying the operation of electronic devices; classical mechanics and classical statistical mechanics, the quantum theory, wave and matrix mechanics, quantum statistics. Prerequisite: graduate status. (1970-71 and alternate years: fall—day; 1971-72 and alternate years: fall—evening)

222 Physical Electronics II (3)

The Boltzmann transport equation, band theory of solids, time dependent perturbation theory, group theory. Applications to semiconductor and other solid-state devices such as transistors, tunnel diodes, masers, and lasers. Prerequisite: EE 221. (1970-71 and alternate years: spring-day; 1971-72 and alternate years: spring-evening)

225 Nonlinear Electronics (3)

Analysis and design of electronic components and systems operating as switching, sweeping, gating, and pulse generators; study of multivibrators, negative resistance devices and amplifiers, nonlinear operation of oscillators. Prerequisite: EE 122, 153; or equivalent. (1970-71 and alternate years: fall-evening; 1971-72 and alternate years: fall-day)

226 Optical Electronics (3)

Design of optical systems. Study of the primary aberrations, quantum theory of radiation, coherence, detection of radiation; with application to electron lenses, lasers, masers, infrared and ultraviolet devices, photoconductors and photodiodes. Prerequisite: EE 221 or equivalent. (1970-71 and alternate years: spring-evening; 1971-72 and alternate years: spring-day)

227 Industrial Electronics (3)

Applications of electronic devices in industry; continuous and sampled control systems; induction and dielectric heating; timing and counting circuits; reliability and automatic checking equipment; digital control of machine tools. Prerequisite: EE 122 or equivalent and graduate status. (Fall-evening)

228 High-frequency Electronics (3)

Design and analysis of the operation of electron-tube, solid-state, crossed-field, space-charge wave, and quantum maser oscillators and amplifying devices that lay the foundation of modern-day communication systems. Prerequisite: EE 133 or equivalent. (Spring-evening)

230 Magnetohydrodynamics (3)

Study of the interaction of fluids with electromagnetic fields. Generalized Navier-Stokes and energy equations, magnetogasdynamic and magnetohydrodynamic approximations, boundary layer theory, statistical theory of turbulence, generalized Von Karman-Howarth equation, Boltzmann transport equation. MHD generators and devices. Prerequisite: EE 133 or equivalent. (Spring-evening)

231 Field Analysis and Potential Theory (3)

General study of the theory of potentials as used to facilitate solution of problems in electromagnetic theory, mechanics, thermodynamics, optics, and gravitation. Emphasis on mathematical methods such as Green's functions, variational methods, principal axis transformations, and multi-dimensional Fourier transforms. Prerequisite: Ap S 211; EE 133 or equivalent. (1970-71 and alternate years: fall-evening; 1971-72 and alternate years: fall-day)

232 Electrodynamics (3)

Special theory of relativity and the Lorentz transformation; Minkowski's four-dimensional formulation; Maxwell's equations in four-dimensional

tensor notation; relativistic Lagrangian and Hamiltonian for a particle; electromagnetic stress tensor; radiation by charges moving at relativistic speeds; Schroedinger and Dirac wave equations, including electromagnetic fields; introduction to quantum electrodynamics. Prerequisite: Ap S 211; EE 133 or equivalent. (1970-71 and alternate years: spring—evening; 1971-72 and alternate years: spring—day)

233 Microwaves and Components (3)

High-frequency transmission lines and guided systems; matching techniques; ferrite isolators, gyrators; Faraday rotation; microwave networks; directional couplers; cavity resonators and microwave components. Prerequisite: EE 133 or equivalent. (Fall—evening)

234 Electromagnetic Wave Propagation (3)

Retarded time scalar, vector, and Hertz potential. Dipole and dipole array fields; Mie Theory of Electromagnetic Scattering by Spheres. Propagation in electrically and magnetically anisotropic media such as dielectric crystals, space-charge plasmas, and ferrites. Wave propagation in inhomogeneous media; Liouville transformation, Lagrange's variation of parameters, WKB solution, invariant imbedding techniques. Propagation in stochastic and dispersive media. Prerequisite: EE 133 or equivalent. (1970-71 and alternate years: spring—day; 1971-72 and alternate years: spring—evening)

235 Antennas (3)

General solution of Maxwell's equations in terms of current sources, the far field approximations, radiation from current distributions, field equivalence theorems, the geometrical optics approximation, aperture antennas, receiving antennas, the theory of arrays, and applications to specific antennas and antenna types. Prerequisite: EE 133 or equivalent. (1970-71 and alternate years: fall—day; 1971-72 and alternate years: fall—evening)

241 Information Theory I (3)

Laws and theorems of probability, statistical measure of uncertainty and information; noiseless coding, communication channels, channel capacity, fundamental theorems of information theory. (1970-71 and alternate years: fall—day; 1971-72 and alternate years: fall—evening)

242 Information Theory II (3)

Error-correcting codes, parity-check coding, information sources, channels with memory, Markov Chains, continuous channels. Prerequisite: EE 241. (1970-71 and alternate years: spring—day; 1971-72 and alternate years: spring—evening)

243 Communication Theory I (3)

Probability, random processes, correlation functions, and power spectra. Output distributions of linear and nonlinear devices with random inputs. Optimum receiver principle, vector channels, optimum receivers for binary and M-ary signals over white Gaussian channels and their error probabilities for different signal sets such as simplex and orthogonal signals. Prerequisite: EE 143. Prerequisite or concurrent registration, Ap S 211. (1970-71 and alternate years: fall—evening; 1971-72 and alternate years: fall—day)

244 Communication Theory II (3)

Schemes of efficient signaling for data sequences and their performance analysis. Channel models, filtering, and optimum modulation and demodulation. Signaling over fading channels and their optimum receivers. Diversity transmission and various reception schemes. Prerequisite: EE 243. (1970-71 and alternate years: spring-evening; 1971-72 and alternate years: spring-day)

246 Digital Communications (3)

Analog-to-digital conversion; the sampling theorem and its implications; applications of the Z-transform; optimum codes and optimum decoding schemes; generation of pseudorandom sequences; choice of optimum wave forms; decision theory and optimum detection schemes; sampled data systems; digital communication systems. Prerequisite: EE 241, 244; or equivalent. (Spring-evening)

247 Communication Systems (3)

Wiener filters, phase-locked loops and their optimization. Parameter estimation theory with application to optimum demodulation of analog wave forms (DSB-AM, SSB-AM, FM). Comparative analysis of analog modulation systems. Digital communication systems—coherent and non-coherent reception of binary and M-ary signals and their performance analysis. Frequency acquisition and synchronization. Prerequisite: EE 243. (Fall-evening)

248 Microwave Communication Systems (3)

Analysis and design of microwave communication systems with emphasis on radar, microwave relay, and satellite systems. Prerequisite: EE 133, 143; or equivalent. (Spring-evening)

250 Application of Numerical Methods (3)

Numerical methods in scientific and engineering problems; development of computer algorithms for the solution of numerical problems; error analysis and sensitivities of numerical methods; use of a procedural computer language in the solution of numerical methods; computer methods for simultaneous equations, interpolation, differentiation and quadrature, solution of ordinary differential equations, boundary value problems, partial differential equations, and linear algebra. Prerequisite: EE 51 or equivalent and permission of instructor. (Spring-evening)

251 Computing Systems (3)

Organization of information processing systems. Interfacing problems, interrupt systems, A/D and D/A conversions, high-speed arithmetic units, random access and associative memories, man-machine communication problems. Time-sharing systems. Advances in computer hardware technology. Prerequisite: EE 154. (1970-71 and alternate years: fall-evening; 1971-72 and alternate years: fall-day)

252 Information Retrieval Systems (3)

Information organization and retrieval of natural language data by digital computer systems; statistical, syntactic, and logical analysis of natural language used for retrieval systems; dictionary systems including thesaurus look-up and phrase structures; searching strategies and cataloguing. Input preparation and output structures; large-scale file structures and operating systems required for their use. Prerequisite: EE 157 or equivalent. (Spring-evening)

253 Finite State Machines (3)

Analysis and design of sequential networks, state diagrams, flow table, equivalence of states, races, transition maps, output tables, hazards, synchronous and asynchronous sequential networks. State assignment problem, partitions, partition pairs, information flow inequalities, clocks, state realizations, parallel and serial decompositions, machine networks and decompositions. State identification. Prerequisite: EE 153. (Fall—evening)

254 Finite Automata (3)

Effectively computable functions, recursive functions, regular expressions, single and multiple tape Turing machines, probabilistic automata, neural nets, reliability of automata, artificial intelligence, learning machines, threshold logic, adaptability, pushdown automata. Prerequisite: EE 251, 253. (Spring—evening)

255 Pattern Recognition, Graphics and Optical Processing (3)

Graphical data processing and display systems; software systems needed for graphical I/O; digital and analog display methods; scanning, sampling, digitizing, and transmission of data; holography, optical memories and systems; storage techniques and processing of images; concept analysis; linear and area transforms; geometry, topology, and syntax of pictures; picture enhancement; resolution analysis; signal-to-noise problems; transformations, projections, and the hidden-line problems. Prerequisite: EE 157 or equivalent and permission of instructor. (Fall—evening)

256 Analog and Hybrid Computers (3)

Analog computer components and electronics. Slow analog computer solutions of linear and nonlinear differential equations. System simulation and modeling on the analog computer. Introduction to the iterative analog computer. Transfer function simulation and use in control theory. The hybrid computer, digital logic and digital computer control. Digital-to-analog and analog-to-digital converters and interfaces. Optimization methods on a hybrid computer. Parameter variations and searching methods. Prerequisite or concurrent registration: EE 154 or permission of instructor. (1970-71 and alternate years: spring—evening; 1971-72 and alternate years: spring—day)

257 Digital Computer Programming Systems (3)

Introduction to the design of computer software and software systems. Design of assemblers and monitor systems. Communication between components of systems. Design of loaders, input-output control systems, and utility systems. Prerequisite: EE 157 or permission of instructor. (1970-71 and alternate years: fall—day; 1971-72 and alternate years: fall—evening)

258 Design of Compilers and High-level Languages (3)

Design of high-level, problem-oriented languages. Grammar, syntax, semantics, and pragmatics as they affect the design of translators and compilers. Context-free languages, pushdown lists, polish-string notation, and addition programming methods used in the construction of compilers and translators. Prerequisite: EE 257 or permission of instructor. (1970-71 and alternate years: spring—day; 1971-72 and alternate years: spring—evening)

259 Systems Programming (3)

Batch processing software systems and their limitations; multiprogramming in fixed and variable partitions; data bases and table driven software; use of list processing in systems programming; multiprocessor systems and fail-soft systems; I/O processing for remote batch and on-line time-sharing systems; introduction to the computer as a utility; real time programming in a multiprogram environment; system subprograms as re-entrant and recursive code. Prerequisite: EE 257 or equivalent. (Fall—evening)

271 Automatic Control in State Space Setting (3)

State space formulation of continuous systems, simulation diagrams, transfer function matrices, matrix representation of state equations, controllability and observability, the state transition matrix, stability analysis, methods of Liapunov. Prerequisite: EE 172 or permission of instructor. (Fall—evening)

272 Digital Control Systems (3)

Sampling processes and theorems; stability criteria, Z-transforms, modified Z-transforms, and responses of sampled-data systems; state variables for discrete systems; examples of practical digital computer control systems; synthesis and design of sampled-data control systems; nonlinear sampled-data control systems. Prerequisite: EE 271 or equivalent. (Spring—evening)

273 Optimal Programming and Control (3)

Optimization theory. Calculus of variations; Euler's equation, fixed and variable end point conditions, boundary value problem, equality constraints, and Lagrange multipliers. Performance indices and penalty functions. The maximum principle and the Hamilton-Jacobi equation. Properties of optimal systems. Functional equations techniques of dynamic programming. Prerequisite: EE 271 or equivalent. (Fall—evening)

275 Stochastic Processes in Automatic Control (3)

Analysis of effects of time-invariant linear control systems on stationary random processes. The optimal filtering problem based on the maximum principle. Iterative parameter estimation using matrix inversion lemma. Analysis and control of multivariable systems in the presence of various disturbances. Stochastic stability. Statistical analysis of nonlinear systems—stationary and nonstationary states. Prerequisite: EE 271 or equivalent. (Fall—evening)

276 Cybernetics (3)

Principles of machines or mechanisms made by men or nature with regard to their ways and forms of possible behaviors: regular, determinate, or reproducible; fundamental concepts of finite differences; changes and transformations as sets of transitions, leading to stability and feedback; statistical concepts of complex systems and blackbox theory; Shannon's information theory; regulation and control of mechanisms. Prerequisite: graduate status and E Ad 115 or equivalent. (Spring—evening)

277 Space Communication Systems (3)

Theoretical and application aspects of space communications, as related to communication satellite systems, scientific satellites, manned space missions, and deep space missions. Prerequisite: graduate status. (Fall—evening)

278 Spacecraft Systems Design (3)

Space environment; structure, propulsion, control, and instrumentation of spacecraft—launch, orbit, transit, and re-entry problems; bioastronautic considerations. Prerequisite: graduate status. (1971-72 and alternate years: spring—evening)

281 Electronic Measurements in Medicine (3)

Theory of measurements in biological areas, techniques for electronic measurements on biological specimens, current problems in medical metrology stressing electronic systems. Prerequisite: EE 284 or permission of instructor. (Fall—evening)

282 Instrumentation in Medical Electronics (3)

Medical telemetry systems, medical use of the computer, engineering techniques in patient treatment, principles of good medical instrumentation. Prerequisite: EE 284 or permission of instructor. (Spring—evening)

283 Introduction to Medicine for Engineers I (3)

Designed to acquaint the engineering student with the physiology of the human body; material based on the curriculum of the School of Medicine and taught from a systems viewpoint; concepts of cellular structure and function integrated into the tissue and organs, which are then related to the various systems of the body; interrelationships of the body systems, i.e., the interaction of the nervous system with the musculoskeletal system or the interaction of the respiratory system and its functions with the cardiovascular system. Prerequisite: EE 184 or equivalent. (Fall—evening)

284 Introduction to Medicine for Engineers II (3)

Clinical aspects of medicine. Further elaboration of physiological systems, such as the endocrine system, renal physiology, gastrointestinal physiology, and others; the separate systems of the body are integrated to present the functioning of the body as an overall system; considerable interaction with physicians and other medical personnel. Prerequisite: EE 283. (Spring—evening)

285 Engineering in Vocational Medicine and Rehabilitation (3)

Application of engineering theory and techniques to the rehabilitation of handicapped persons; major problem areas and general approaches, as well as specific solutions. Offered cooperatively with personnel from the Social and Rehabilitation Services Administration. Prerequisite: EE 284. (Fall—evening)

298 Research (arr.)

Research as arranged. May be repeated for credit. (Fall and spring—as arranged)

299-300 Thesis Research (3-3)

(Academic year—as arranged)

319 Networks Research (arr.)

Limited to students preparing for the Doctor of Science qualifying examination. May be repeated for credit. (Fall and spring—as arranged)

329 Electronics Research (arr.)

Limited to students preparing for the Doctor of Science qualifying examination. May be repeated for credit. (Fall and spring—as arranged)

339 Fields and Waves Research (arr.)

Limited to students preparing for the Doctor of Science qualifying examination. May be repeated for credit. (Fall and spring—as arranged)

349 Communications Research (arr.)

Limited to students preparing for the Doctor of Science qualifying examination. May be repeated for credit. (Fall and spring—as arranged)

359 Computer Science Research (arr.)

Limited to students preparing for the Doctor of Science qualifying examination. May be repeated for credit. (Fall and spring—as arranged)

371 Simulation Methods for System Analysis (3)

Survey of simulation languages. Techniques of model building for material- and machine-based systems. Treatment of these systems with notion of transactions and states. Modeling the dynamic processes of growth problems. Analog, hybrid, and digital methods for simulation treated by means of case studies; speed and cost of alternate computing procedures. Project-type problems used to illustrate simulation methods. Prerequisite: EE 256 or permission of instructor. (Fall—evening)

372 Analysis and Control of Large Systems (3)

Systems as multistage decision processes. Analytical concepts of model making and matrix representation for computer mechanization. Recursive digital computer algorithm for economy in storage and computing time. System identification. Adaptive control systems. Prerequisite: EE 273 or equivalent. (Spring—evening)

379 Controls and Systems Research (arr.)

Limited to students preparing for the Doctor of Science qualifying examination. May be repeated for credit. (Fall and spring—as arranged)

389 Medical Engineering Research (arr.)

Limited to students preparing for the Doctor of Science qualifying examination. May be repeated for credit. (Fall and spring—as arranged)

399 Dissertation Research (arr.)

Limited to Doctor of Science candidates. May be repeated for credit. (Fall and spring—as arranged)

Engineering Administration*

Professors P.A. Crafton, H.E. Smith (*Chairman*), P.S. Shane, John Kaye, R.E. Cronin, Kenneth Johnson, W.H. Marlow, R.J. Wilson (*Research*)
Associate Professors Donald Gross, N.D. Singpurwalla
Associate Professorial Lecturers L.S. Rotolo, Victor Selman, R.W. Bublitz,
 D.H. Jermain, F.A. Miercort, Carl Harris

* Staff of instruction for the academic year 1969-70.

Assistant Professors J.B. Smith, Jr., C.E. Pinkus
Assistant Professorial Lecturers R.A. Smith, John Waller
Lecturer G.R. McNichols

FIELDS AND AREAS OF CONCENTRATION—GRADUATE

Engineering Administration	Operations Research
Management of Research and Development	Systems Analysis

UNDERGRADUATE COURSES

115 Probabilistic and Statistical Methods in Engineering (3)

(Formerly Engineering Analysis)

Solution of engineering problems using sets and functions; probability models; distributions and functions; statistical concepts and methods, including hypothesis testing, correlation, and regression. Prerequisite: Math 32 or 24. (Fall and spring)

140 Engineering Economics (3)

Theory and practice of engineering economics. Consideration of economic factors in engineering design decisions. Prerequisite: senior status. (Spring)

GRADUATE COURSES

204 Administration of Engineering Contracts (3)

Study of the total contracting process, including initial budget preparation and justification, actions leading to the execution of a contract, and administration of the contract to completion; considered from the viewpoints of the industrial and government buyer and the seller of technical materials and services. (Fall and spring)

207 Personnel Administration (3)

Study of the functions of managing personnel, with emphasis on relationships within organizations which utilize the services of engineers and scientists; employment, management, development, wages and classification, union relations, safety, health and collateral benefits and services, human relations, personnel research in the field. (Fall and spring)

210 Engineering Law (3)

Legal principles and procedures of interest to engineers, the American Legal System, contracts and specifications, liability of professional engineers, antitrust problems, agency relationships, negotiable instruments, patent and proprietary rights, special problems in research and developmental contracts. (Fall and spring)

211-12 Engineering Administration (3-3)

Comprehensive and systematic study of the administrative process with emphasis on industrial, scientific, and engineering environments. Planning: objectives, prediction, policies, plans and characteristics of plans. Organizing: theory of organization, structure, authority, specialization, delegation, staff and committees. Directing: leadership, managing human and

material resources. Controlling: setting standards, evaluating performance, using system feedback data for correction and improvement. (Academic year)

253 Production Management (3)

Planning, organizing, and control of production; forecasting techniques; material management; methods of loading and scheduling production processes; electronic methods in production control. Organization and administration of the plant engineering function with emphasis on maintenance control programs. (Spring)

254 Automatic Data Processing Systems (3)

Logic of computers, arithmetic and control units, systems analysis for data processing applications, systems design, systems economics, relation to scientific decision processes. (Fall and spring)

255 Administration of Research and Development (3)

Study of contemporary practices of administrators of scientific and engineering research and development; the relation of these studies to accepted managerial concepts, and their effect on contemporary managerial hierarchies and organizational structures. (Fall and spring)

261 Economic Analysis in Engineering Planning (3)

Important concepts and theories employed in economic analysis of engineering projects. Application of various analytical processes. Detailed practice in pursuit of solutions to, and adjustment of, persistent and current problems in this field. (Fall and spring)

269 Elements of Decision Making and Problem Solving (3)

(Formerly Operations Research I)

History and orientation of operations research; concept of quantitative decision making; decision criteria under certainty, risk, and uncertainty; utility; the time factor; replacement models; simulation; Monte Carlo techniques. Prerequisite: E Ad 115 or equivalent. (Fall and spring)

270 Survey of Operations Research Methods (3)

(Formerly Operations Research II)

Basic concepts and techniques of operations research as applied to problems in industrial, governmental, and military decision making. Game theory, allocation models including the simplex procedure of linear programming, transportation and assignment models, queuing theory, inventory theory. Prerequisite: E Ad 115 or equivalent. (Fall and spring)

272 Problems in Operations Research (3)

Field experience in operations research on a team basis. Each small group locates an actual problem and formulates solution by operations research models. Class evaluation of progress. (Spring)

273 Mathematics for Operations Research (3)

Mathematical methods used in the operations research areas of mathematical programming; game, queuing, and inventory theory. Matrices and linear vector spaces, differential-difference equations, integral transforms, mathematical probability, stochastic processes. (Fall and spring)

275 Linear Programming (3)

Basic computational, theoretical, and applied areas with emphasis on the general linear programming problems; simplex procedures; duality problems; parametric linear programming and sensitivity analysis, transportation problem. (Fall and spring)

276 Theory of Games (3)

Study of mathematical models with applications to the relationships among independent competitive entities (persons or organizations in environment of competition, bargaining, bidding), selection of optimum strategies, minimax concept, connections with linear programming and decision functions, two-person and n-person zero and nonzero sum games. (Fall)

277 Queuing Theory (3)

Study and analysis of waiting line systems, birth and death processes, arrival and service patterns, single- and multi-channel systems, variations in queuing disciplines. (Spring)

278 Nonlinear and Dynamic Programming (3)

Static and dynamic optimization problems including convex, quadratic, and separable programs; network problems; problems in the calculus of variation. Gradient, Lagrangian, and penalty functions techniques. (Spring)

279 Inventory Control (3)

Application of mathematical techniques to decisions regarding when and how much to produce or purchase, control of production and inventory systems, various mathematical models of inventory systems with deterministic and stochastic demands, forecasting demand, interaction of production and inventory systems, simulation models. (Fall)

281-82 Systems Analysis and Management (3-3)

Systems analysis as applied to management. Properties, nature, structure, and organization of systems; conceptualization of total system. Operational functioning and description of systems. Boundary and feedback concepts. Objectives of systems analysis, concept of planning, problem definition, choosing objectives for analysis. Relationship with other fields. Systems analysis as a methodology for exploring alternatives, assumptions, criteria, and risk. Decision making, measurement, and value theory in systems analysis. (Academic year)

283 Systems Engineering I (3)

Concept of system structure and organization. Linear and nonlinear systems analysis, simulation and modeling; statistical and gaming methods in systems analysis. Introduction to optimization methods and flow graph theorems. (Fall)

284 Systems Engineering II (3)

Design of systems, subsystems, and components. Dynamics and stability of systems; adaptive systems; system logic, tolerances, variations, and disturbances; signals and noise; system optimization. Prerequisite: E Ad 283. (Spring)

285 Seminar: Administrative Problems (3)

Individual analysis of complex administrative problems, with group evaluation and discussion. Prerequisite: 18 semester hours of graduate credit. (Fall and spring)

293 Technical Enterprises (3)

Analysis of essential features of technology-based companies. Organization and launching of technical firms for whom the Federal Government is the principal customer. Planning the initial phases of operation, recruiting talent, financing and establishing a viable base. Case studies and a detailed plan for a venture. This course is designed for those within technical firms and those who depend on them as suppliers. (Fall)

294 Marketing of Technology (3)

Particular problems related to selling technical projects. Organization of the work and its performance, emphasis on marketing; proposal strategy, bidding reputation, competition, negotiation, the government's market. (Spring)

295 Management of Technical Information (3)

Needs and objectives of technical information systems, functions involved in technical information, storage and retrieval, abstracting, computer usage in technical information systems, system organization. (Spring)

296 Reliability Engineering (3)

Quantitative methods in the theory of reliability, mathematical models, design considerations, failure and repair rates, prediction models for non-maintained and maintained systems, trade-off factors, new developments in operations research applied to reliability. (Fall)

297 Problems in Engineering Administration (3)

Guided experience in analyzing, solving, and reporting on field problems in engineering administration. Prior to registration, the student must have identified a suitable problem, not necessarily related to the Master's thesis topic, on which he will work. (Fall)

298 Research (arr.)

Basic or applied research in engineering administration. May be repeated for credit. (Fall and spring)

299-300 Thesis Research (3-3)

(Academic year)

397 Advanced Topics in Operations Research (3)

Limited to students preparing for the Doctor of Science qualifying examination who have a major interest in operations research. Advanced topics from the literature of operations research for analysis, presentation, and discussion. Reading assignments from the professional journals selected by the instructor and the student. (Fall or spring)

398 Advanced Reading and Research (arr.)

Limited to students preparing for the Doctor of Science qualifying examination. May be repeated for credit. (Fall and spring)

399 Dissertation Research (arr.)

Limited to Doctor of Science candidates. May be repeated for credit. (Fall and spring)

Engineering Mechanics*

Professors C.H. Walther, G.M. Arkilic, R.R. Fox, Harold Liebowitz, Alfred Freudenthal (*Acting Chairman*), S.W. Yuan, Warren Mason (*Research*), W.A. Wood (*Research*), Joseph Foa
 Adjunct Professors J.E. Duberg, I.E. Garrick
 Professorial Lecturers Paul Zilczer, R.E. Fulton, R.R. Hunziker
 Associate Professors John Eftis, B.I. Hyman, A.M. Kiper, T.G. Toridis, E.N. Pugh
 Associate Professorial Lecturers M.P. Gaus, W.D. Erickson, R.W. Fralich, E.T. Kruszewski, Walter Olstad, M.J. Queijo, J.P. Raney, L.D. Staton, E.C. Yates, Jr., Shou-Ling Wang, Michael Yachnis
 Assistant Professors D.L. Jones, G.K. Lea, J.L. Whitesides, Jr. (*Research*)
 Assistant Professorial Lecturers F.J. Hughes, R.W. Barnwell, J.D. Buckley, A.R. Saunders, L.H. Blakey, F.M. Calabria
 Lecturer S.H. Sandler

UNDERGRADUATE FIELDS

Civil Engineering (see page 25).

Mechanical Engineering (see pages 29-31).

FIELDS AND AREAS OF CONCENTRATION—GRADUATE

Programs of study in any field of concentration will generally include courses from appropriate allied areas.

Acoustics†

Engineering Mechanics

- †270 Introduction to Acoustics
- †275 Advanced Theoretical Acoustics
- †276 Random Process Theory
- †277 Physical Acoustics

- †278 Psychological and Physiological Acoustics
- †280 Special Topics in Acoustics
- 298 Research
- 299-300 Thesis Research

Mechanical Engineering

- 215 Theory of Vibrations

- 221 Intermediate Fluid Mechanics

Aerospace Engineering†

Engineering Mechanics

- 217 Analytical Mechanics
- 218 Mechanics of Orbits and Trajectories
- 220 Nonlinear Mechanics
- 223 Celestial Mechanics
- †262 Mechanics of Space Flight

- †263 Atmospheric Physics for Engineers
- †265 Dynamic Stability of Airplanes
- 298 Research
- 299-300 Thesis Research

* Staff of instruction for the academic year 1969-70.

† Offered at NASA-Langley Research Center; may be offered on campus when arranged.

Mechanical Engineering

- *283 Advanced Propulsion Systems *293-94 Aerothermochemistry I, II

Fluid Mechanics**Mechanical Engineering**

- | | |
|---------------------------------------|-----------------------------------|
| 221 Intermediate Fluid Mechanics | 298 Research |
| 227 Viscous Flow | 299-300 Thesis Research |
| 231 Hydrodynamics | 315 Hypersonic Flow |
| 235 Compressible Flow | 317 Physical Gas Dynamics |
| 285 Reaction Kinetics | 398 Advanced Reading and Research |
| *290 Kinetic Theory of Gases | 399 Dissertation Research |
| 297 Special Topics in Fluid Mechanics | |

Materials Science**Engineering Mechanics**

- | | |
|---|-----------------------------------|
| *231 Solid State for Engineers | 240 Fracture Mechanics |
| 232 Advanced Materials Science | 298 Research |
| 234 Composite Materials | 299-300 Thesis Research |
| *235 Physical Metallurgy | 398 Advanced Reading and Research |
| *237 Quantum Mechanical Treatment of Metals | 399 Dissertation Research |
| *239 Physical Ceramics | |

Ocean Sciences and Engineering**Civil Engineering**

- | | |
|---|-----------------------------------|
| 253 Probabilistic Structural Mechanics | 298 Research |
| 258 Design of Fixed Maritime Structures | 299-300 Thesis Research |
| 275 Special Topics in Ocean Engineering | 398 Advanced Reading and Research |
| | 399 Dissertation Research |

Engineering Mechanics

- 228 Physical Oceanography

Geology†

- | | |
|-------------------------------|---------------------------|
| 241 Geochemistry | 249 Seminar: Geochemistry |
| 242 Experimental Geochemistry | |

Mechanical Engineering

- 218 Design of Floating and Submerged Marine Vehicles

* Offered at NASA-Langley Research Center; may be offered on campus when arranged.
 † For geology course descriptions, see the *Undergraduate and Graduate Catalogue*.

Soil Mechanics and Foundation Engineering**Civil Engineering**

204	Geotechnics in Soil Mechanics	298	Research
205	Theoretical Soil Mechanics	299-300	Thesis Research
206	Foundation Engineering	398	Advanced Reading and Research
207	Special Topics in Soil Mechanics	399	Dissertation Research

Solid Mechanics**Engineering Mechanics**

221-22	Theory of Elasticity I, II	298	Research
236	Wave Propagation in Solids	299-300	Thesis Research
256	Introduction to the Theories of Inelastic Media	398	Advanced Reading and Research
259	Nonlinear Mechanics of Continua	399	Dissertation Research
290	Special Topics in Nonlinear Mechanics of Continua		

Structural Engineering**Civil Engineering**

201	Metal Structures	254	Special Topics in Structural Mechanics
202	Ultimate Strength of Reinforced Concrete Structures	255	Analysis of Plate Structures
203	Prestressed Concrete Structures	256	Analysis of Shell Structures
210	Analysis of Structures	263-64	Theory of Structural Stability I, II
212	Concepts of Structural Design	298	Research
213	Structural Design for Dynamic Loads	299-300	Thesis Research
252	Structural Dynamics	398	Advanced Reading and Research
253	Probabilistic Structural Mechanics	399	Dissertation Research

Thermal Sciences**Mechanical Engineering**

280	Advanced Thermodynamics	295	Statistical Thermodynamics
281	Nonequilibrium Thermodynamics	296	Special Topics in Heat and Mass Transfer
284	Combustion Processes	298	Research
287	Heat Conduction	299-300	Thesis Research
288	Convective Heat and Mass Transfer	398	Advanced Reading and Research
289	Radiative Heat Transfer	399	Dissertation Research
291-92	Energy Conversion		

ENGINEERING MECHANICS**GRADUATE COURSES****217 Analytical Mechanics (3)**

Fundamental principles, generalized coordinates, variational principles and Lagrange's equations, nonholonomic systems, Hamilton's equations, theory of small oscillations. Prerequisite or concurrent registration: Ap S 211 (Spring)

218 Mechanics of Orbits and Trajectories (3)

Celestial mechanics; orbits and trajectories in force fields. Dynamics of space vehicles. Prerequisite: EM 217 or Phys 232. (1971-72 and alternate years: fall)

220 Nonlinear Mechanics (3)

Topological and analytical methods in nonlinear mechanics, nonlinear resonance, relaxation oscillations. Prerequisite: EM 217. (1970-71 and alternate years: spring)

221 Theory of Elasticity I (3)

Infinitesimal strain and rotation, stress, constitutive relations and basic field equations of linear elasticity, uniqueness of solutions; elements of pure torsion and flexure of rods; plane problems in elastostatics illustrating potential and Fourier integral methods of solutions. Prerequisite: approval of Department. (Spring)

222 Theory of Elasticity II (3)

Solution of plane problems in terms of analytic functions of a complex variable; three-dimensional elastostatics; solutions by displacement and stress potentials, integral representations and integral transforms; elements of elastic waves, elastodynamic boundary value problems, and uncoupled thermoelasticity. Prerequisite: Ap S 211, EM 221. Prerequisite or concurrent registration: Ap S 213. (1971-72 and alternate years: fall)

223 Celestial Mechanics (3)

General equations of motion, Lagrange's planetary equations, disturbing function, Delaunay and Poincaré variables, secular inequalities, lunar theory, precession and nutation. Prerequisite: EM 217. (1970-71 and alternate years: spring)

228 Physical Oceanography (3)

Seawater, equations of motion, interaction between air and sea, currents, wind-waves in deep and shallow waters, long ocean waves, tides, wave-statistics, sea ice. Prerequisite: ME 221 or equivalent. (1970-71 and alternate years: fall)

***231 Solid State for Engineers (3)**

(Formerly Ap S 216)

Crystal structure and binding, elastic constants, lattice vibrations, thermal properties, free electron theory of metals, band theory of solids, semiconductors, rectifiers and transistors, superconductivity. Prerequisite: approval of Department. (1970-71 and alternate years: fall)

* Offered at NASA-Langley Research Center; may be offered on campus when arranged.

232 Advanced Materials Science (3)

Simple crystal structures; the defect crystal structure—point defects, line defects, surface defects; grain-boundaries; X-ray and electron diffraction; diffusion in solids, metallic solutions, and compounds; ceramics; polymeric materials; elastic properties; internal friction; geometry, statics and dynamics of dislocations; microplasticity, plasticity, work-hardening, and fatigue; creep; strengthening mechanisms; radiation damage; cohesive strength. Prerequisite: approval of Department. (1971–72 and alternate years: fall)

234 Composite Materials (3)

Principles of composites and composite reinforcement; micromechanics and failure; interface reactions in various composites; reinforcing materials; structure of composites—fiber-reinforced polymers, filler-reinforced polymers, fiber-reinforced metals, directionally solidified alloys, dispersion-strengthened metals. Prerequisite: approval of Department. (1971–72 and alternate years: spring)

***235 Physical Metallurgy (3)**

(Formerly Ap S 235)

Relations among structures, properties, and reactions of metals and alloys; structures and equilibria, kinematics of physical and chemical reactions; plastic deformation mechanisms, diffusion, solid reactions; phase diagrams and phase transformations, recrystallization and grain growth; dislocations—their formation and multiplication in crystal structures; elementary strengthening mechanisms. Prerequisite: EM 232 or approval of Department. (1970–71 and alternate years: fall)

236 Wave Propagation in Solids (3)

Small amplitude plane and spherical wave propagation in unbounded elastic media; dilational, shear, and surface waves; reflection and refraction of plane waves; free waves in finite bodies. Prerequisite: EM 221 or approval of Department. (Not offered 1970–71)

***237 Quantum Mechanical Treatment of Metals (3)**

(Formerly Ap S 241)

Elements of quantum mechanics, including Schroedinger equation and elementary perturbation theory. Applications to basic processes in the theory of solids: lattice waves, electron states, electron-electron and electron-phonon interactions. Boltzmann equation and transport properties; Fermi surfaces; theory of superconductivity. Prerequisite: EM 231 or approval of Department. (1970–71 and alternate years: spring)

***239 Physical Ceramics (3)**

(Formerly Ap S 248)

Crystal chemistry and the systematic study of the structure of ceramic materials; solid reactions occurring at elevated temperatures; sintering vitrification, diffusional mechanisms and effects; reaction rate theory; elastic, anelastic, and plastic properties of ionic and covalent solids; viscoelastic behavior of vitreous and vitreous-solid systems; phase equilibria of ceramic systems. Prerequisite: approval of Department. (1970–71 and alternate years: spring)

* Offered at NASA-Langley Research Center; may be offered on campus when arranged.

240 Fracture Mechanics (3)

Fundamentals of brittle fracture, Griffith theory and extensions, mechanics of fracture, linear elastic systems, plasticity considerations, fracture toughness, engineering analysis, notch strength analysis with limit approach, crack propagation laws, fatigue, fracture testing, comparison of recent continuum theories. Prerequisite: approval of Department. (Spring)

256 Introduction to the Theories of Inelastic Media (3)

Physical basis of anelasticity, viscoelasticity, plasticity, and viscoplasticity; constitutive equations of elastic and viscoelastic media; foundations of theories of plasticity and viscoplasticity; one- and two-dimensional boundary value problems in linear-visco-elastic and elastic-plastic media; the rigid-plastic medium; simple problems in nonlinear viscous and viscoplastic media; wave propagation in inelastic media. Prerequisite: approval of Department. (Fall)

259 Nonlinear Mechanics of Continua (3)

Development of fundamental concepts of nonlinear media and their applications. Prerequisite: Ap S 212 and EM 221, or EM 256. (1971-72 and alternate years: spring)

***262 Mechanics of Space Flight (3)**

(Formerly Ap S 225)

First- and second-order Hamiltonian-Jacobi perturbation theory applied to artificial satellites, von Zeipel's methods, special and general perturbation theories for third-body perturbations. Differential correction or orbits by weighted least squares and minimum variance techniques. Comparison of various filtering techniques as applied to orbit determination and other space flight parameter estimation. Prerequisite: EM 217 or approval of Department. (As arranged)

***263 Atmospheric Physics for Engineers (3)**

Introduction to physical processes in the earth's atmosphere; comparisons to the atmospheres of other planets. Topics: evolution, structure, dynamics, visible phenomena, the ionosphere, and radiation processes. Prerequisite: approval of Department. (As arranged)

***265 Dynamic Stability of Airplanes (3)**

(Formerly Ap S 228)

Derivation of equations of motion, Euler transformations and direction cosines, stability derivatives and linearization of equations of motion, stability of linear systems with application to longitudinal and lateral dynamics, Laplace transform techniques and frequency response analysis. Prerequisite: EM 217 or approval of Department. (As arranged)

***270 Introduction to Acoustics (3)**

Waves in an infinite medium, energy and intensity, transmission in layered media, source and dipole fields, electrical and acoustical analogies, resonators, horns and wave guides, normal modes and sound sources in ducts, physiological and architectural acoustics. Prerequisite: approval of Department. (As arranged)

* Offered at NASA-Langley Research Center; may be offered on campus when arranged.

***275 Advanced Theoretical Acoustics (3)**

Classical scattering and diffraction problems, coupled acoustical and mechanical systems, acoustics of moving sources, propeller noise, principle of least time, Snell's law and ray tracing, introduction to boundary and jet noise. Prerequisite: EM 270, ME 215. (As arranged)

***276 Random Process Theory (3)**

Probability theory and probability distributions; random variables and types of random process; relations between correlation functions, power spectra, and indicial response; measurement and use of power spectra; behavior of physical systems under random inputs. Prerequisite: approval of Department. (As arranged)

***277 Physical Acoustics (3)**

Waves in dissipative media, nonlinear aspects of acoustics, acoustic streaming, unsteady boundary layers, interaction of sound with turbulence, aerodynamic noise generation, atmospheric attenuation, thermal and viscous phenomena. Prerequisite: EM 275, ME 221. (As arranged)

***278 Psychological and Physiological Acoustics (3)**

Anatomy and physiology of the ear, experimental methodology in psychoacoustics, subjective responses to noise, acoustical controls and displays, effects of aircraft noise and sonic boom on people, human response criteria for noise control, effects of noise on human performance and physiology, current problems in acoustical theory and technology. Prerequisite: approval of Department. (As arranged)

***280 Special Topics in Acoustics (3)**

Current methods and problems in acoustics. Topics chosen from such areas as aerospace noise generation and control; instruments and procedures for acoustics measurements; and responses of structures, people, and communities to noise. Prerequisite: approval of Department. (As arranged)

290 Special Topics in Nonlinear Mechanics of Continua (3)

Introduction to special topics in nonlinear theories of continuous media such as the elastic dielectric, multi-polar theories, continuous theory of dislocations; crystal elasticity based on quantum-solid state considerations. Prerequisite: EM 259. (Not offered 1970-71)

298 Research (arr.)

Basic research projects as arranged. May be repeated for credit. (Fall and spring)

299-300 Thesis Research (3-3)

(Academic year)

398 Advanced Reading and Research (arr.)

Limited to students preparing for the Doctor of Science qualifying examination. May be repeated for credit. (Fall and spring)

399 Dissertation Research (arr.)

Limited to Doctor of Science candidates. May be repeated for credit. (Fall and spring)

* Offered at NASA-Langley Research Center; may be offered on campus when arranged.

CIVIL ENGINEERING**UNDERGRADUATE COURSES****120 Introduction to the Mechanics of Solids (4)**

(Formerly Ap S 60 Introductory Analytical Mechanics II)

Concepts of stress, strain, and strain energy; stress and deformation in slender members due to axial, torsional, and transverse loads; introduction to yield criteria and inelastic deformations. Prerequisite: Ap S 59. (Fall)

121-22 Structural Theory (3-3)

Theory of determinate and indeterminate structures using both classical and modern approaches. Prerequisite: CE 120. (Academic year)

140 Materials Science (3)

Electron structure of atoms; atomic and molecular bonding; energy bands; crystal structure; imperfections; noncrystalline solids; reaction rates; diffusion; transport phenomena—thermal conductivity, electrical conduction; semiconductors; magnetism; elasticity and anelastic phenomena; microplasticity; plastic deformation; fracture. Prerequisite or concurrent registration: Ap S 113, Phys 32. (Spring)

166 Materials Engineering (2)

(This course, together with CE 167, replaces former CE 165 Materials Engineering (3))

Mechanical properties and mechanical testing; effect of microstructure on the mechanical behavior of metals, ceramics, polymers, and polyphase materials; effect of strain-rate, cyclic strain, and temperature; effect of surface and environment; creep, fatigue, and fracture; materials evaluation for performance. Prerequisite: CE 120, 140; or approval of Department. (Fall)

167 Materials Engineering Laboratory (1)

(This course, together with CE 166, replaces former CE 165 Materials Engineering (3))

Measurement of strains and forces; determination of elastic, anelastic, and rubber-elastic parameters; observation of microplastic and plastic deformation; plastic instability; creep, creep-instability, and creep-fracture; brittle fracture; fatigue and cyclic state. Prerequisite or concurrent registration: CE 166. (Fall)

168 Soil Mechanics (3)

Analysis of lateral earth pressures, bearing capacity, foundations, and slope stability, plus design problems involving the engineering properties of soils. Prerequisite: CE 161. (Spring)

181 Applied Earth Science (2)

Formation and character of natural soil deposits; identification, classification, and engineering properties of soil and rock; subsurface exploration; ground water flow and seepage. Prerequisite: CE 120, ME 126. (Fall)

183 Urban Planning (3)

Engineering aspects of urban planning, including transportation, water supply and sewerage, public utilities, safety and convenience, and natural environment. Prerequisite: senior status. (Spring)

185 Soil Engineering Laboratory (1)

Laboratory experiments for the classification, strength, compressibility, and general engineering properties of soils. Prerequisite or concurrent registration: CE 181. (Fall)

186 Advanced Mechanics of Solids (3)

Deformation and strain, stress, invariants, constitutive equations. Elastic, viscoelastic, elastic-plastic, and viscoplastic tension; technical beam theory; eccentric bending; buckling; and torsion. Failure criteria and mechanisms. Prerequisite: senior status. (As arranged)

190 Legal and Economic Aspects of Engineering (2)

Laws relating to engineering practice, preparation of contract documents and specifications, consideration of economic factors in engineering design decisions. Prerequisite: senior status. (Spring)

191-92 Structural Design (3-3)

Concepts of structural design, elastic and plastic design of metal structures, elastic design and ultimate strength design of reinforced and prestressed concrete structures, individual design problems. Prerequisite: CE 122, 166. (Academic year)

193 Design of Hydraulic Structures (3)

Hydraulics of pipes and open channels, hydraulic machinery, hydrology, and design of hydraulic structures in engineering projects. Prerequisite: ME 126. (Fall)

195 Urban Transportation Engineering (3)

Relation of transportation to urban planning; transport systems; transportation planning and design, including surveys, data analysis, economics, and coordination of systems. Prerequisite: senior status. (Fall)

196 Introductory Structural Reliability (3)

Aspects of probabilistic structural analysis, safety and the probability of structural failure, reliability, probability distributions of physical relevance, statistics of extremes, safety and reliability under conditions of fatigue and creep, structural response to stochastic forces, dynamic excitation, decision rules for optimal design, coastal engineering applications. Prerequisite: senior status. (Spring)

197 Sanitary Engineering (3)

Design aspects of water supply and waste-water disposal, water quality and water treatment processes, characteristics of sewage and its treatment processes. Prerequisite: CE 193 and senior status. (Spring)

198 Research (1 to 3)

Applied research and experimentation projects, as arranged. Prerequisite: junior or senior status. (Fall and spring)

GRADUATE COURSES**201 Metal Structures (3)**

Structural behavior and failure of metal structures, materials, residual stresses, analysis and design of connections and members, theory of plastic collapse of structures, plastic design. (1971-72 and alternate years: fall)

202 Ultimate Strength of Reinforced Concrete Structures (3)

Modes of failure of reinforced concrete structures; experimental data on failure; ultimate strength concepts for the analysis of beams, slabs, and columns. (1970-71 and alternate years: fall)

203 Prestressed Concrete Structures (3)

Structural behavior and failure of prestressed concrete structures; materials; theory, analysis, and design of prestressed concrete structures and members. (1970-71 and alternate years: spring)

204 Geotechnics in Soil Mechanics (3)

Dynamic geology in the formation and properties of soils; Boussinesq and Westergaard equations for stresses and deformations in soil masses; analysis of settlement; flow of water in soils; solutions of Laplace-type equations for seepage involving foundations, earth dams, and wells; theory of frost action. Selected experiments in the soil mechanics laboratory. Prerequisite: graduate status. (1971-72 and alternate years: fall)

205 Theoretical Soil Mechanics (3)

Theories of soil strength and conditions for failure, bearing capacity of footings, pile foundations, theories of lateral earth pressure, stability of slopes, soil dynamics. Selected experiments in the soil mechanics laboratory. Prerequisite: graduate status. (1971-72 and alternate years: spring)

206 Foundation Engineering (3)

Principles of soil mechanics and structural mechanics in the analysis and design of spread footings, mat and pile foundations, retaining walls, sheet piling, and water front structures. Prerequisite: graduate status. (1970-71 and alternate years: spring)

207 Special Topics in Soil Mechanics (3)

Soil rheology, dynamics of foundations, computer applications, lunar soil mechanics, excavation with nuclear explosives, and sampling and testing of ocean bottom sediments. Prerequisite: approval of Department. (1970-71 and alternate years: fall)

210 Analysis of Structures (3)

Classical and modern methods of analysis of statically indeterminate structures, including matrix analysis, variational methods, theory of plastic collapse. Prerequisite: graduate status. (Fall)

212 Concepts of Structural Design (3)

Advanced seminar relating theoretical and experimental knowledge to the problems of function, form, mechanical behavior, failure, and analysis of structures. Prerequisite: CE 201, 202, or 203; and 210. (1971-72 and alternate years: fall)

213 Structural Design for Dynamic Loads (3)

Analysis and design of structures for wind loads, earthquake, and blast loads; design of structural elements in concrete and steel; details of connections; discussions of applicable building codes as well as current literature. Prerequisite: approval of Department. (1971-72 and alternate years: spring)

- 220 Transportation Engineering (3)**
Elements of transportation technology: mass transportation systems, airports, highways, inland waterways. Problems of design and construction. Prerequisite: approval of Department. (1971-72 and alternate years: spring)
- 223 Traffic Engineering (3)**
Problems of traffic forecasting and planning for the various modes of transportation. Impact on and interaction with urban planning. Prerequisite: E Ad 115 or equivalent and approval of Department. (1970-71 and alternate years: fall)
- 252 Structural Dynamics (3)**
Analysis of elastic structures under various dynamic loadings, both steady-state and transient; including vibrations of rigid frames, plates, and thin shells. Prerequisite: approval of Department. (1970-71 and alternate years: fall)
- 253 Probabilistic Structural Mechanics (3)**
Stochastic load processes—wind, earthquake, sea; linear structures with finite number of degrees of freedom; linear continuous structures; non-linear structures; failure under stochastic loading—first exceedance, damage accumulation. Prerequisite: CE 252, E Ad 115; or equivalent. (1971-72 and alternate years: spring)
- 254 Special Topics in Structural Mechanics (3)**
Selected problems in structural mechanics, including finite element techniques, thermal stresses in one- and two-dimensional structures, impact of elastic bodies, and other current topics of interest. Prerequisite: CE 210 or approval of Department. (1970-71 and alternate years: spring)
- 255 Analysis of Plate Structures (3)**
Bending and stretching of thin elastic plates under lateral and in plane loading with various boundary conditions, continuous plates and plates on elastic foundations, buckling of plates, theory of folded plate structure. Prerequisite: approval of Department. (1971-72 and alternate years: fall)
- 256 Analysis of Shell Structures (3)**
Theory of curved surfaces; general linear bending theory, specialization to membrane theory; bending stresses in shells of revolution, shallow shell theory. Approximate analytical solutions and computer-oriented methods. Applications to specific shapes and loadings, pressure vessels, domes and roofs. Prerequisite: approval of Department. (1971-72 and alternate years: spring)
- 258 Design of Fixed Maritime Structures (3)**
Wave forces. Interaction between structures and waves; design of flexible structures—piers, off-shore platforms, jetties; design of rigid structures—breakwaters and seawalls; shore protection structures; moorings and cables. Prerequisite: CE 253, EM 228; CE 206 or equivalent. (1971-72 and alternate years: spring)

263 Theory of Structural Stability I (3)

General criteria for stability; buckling of elastic, plastic, and viscoelastic columns and frames; torsional and lateral buckling; variational and numerical methods. Prerequisite: approval of Department. (1970-71 and alternate years: fall)

264 Theory of Structural Stability II (3)

Buckling and postbuckling behavior of plates and shells under static and dynamic loads, stability of stiffened structures, snap-through of shallow shells, effect of imperfections and boundary conditions. Prerequisite: CE 255 or 256, and 263. (1970-71 and alternate years: spring)

275 Special Topics in Ocean Engineering (3)

Selected problems of current interest in ocean engineering, such as materials and design criteria for hydrospace structures, dynamics of currents and waves, anchors and foundations of the ocean bottom, and life support equipment. (1970-71 and alternate years: spring)

298 Research (arr.)

Basic research projects, as arranged. May be repeated for credit. (Fall and spring)

299-300 Thesis Research (3-3)
(Academic year)**398 Advanced Reading and Research (arr.)**

Limited to students preparing for the Doctor of Science qualifying examination. May be repeated for credit. (Fall and spring)

399 Dissertation Research (arr.)

Limited to Doctor of Science candidates. May be repeated for credit. (Fall and spring)

MECHANICAL ENGINEERING**UNDERGRADUATE COURSES****120 Methods of Engineering Experimentation (2)**

Engineering reports and presentation of experimental information. Introduction and demonstration of various types of measuring equipment, including strain gages, oscilloscopes, transducers, etc. Laboratory includes introduction to experimental techniques and experiments designed for the purpose of familiarization with basic equipment. Prerequisite: Phys 51, 52. (Spring)

126 Fluid Mechanics (3)

Basic laws of incompressible fluid flow and their application; introduction to boundary layer theory. Prerequisite: Ap S 59. (Spring)

131 Thermodynamics (3)

Fundamental thermodynamic concepts from classical and statistical viewpoints; thermal equilibrium and temperature; the first law of thermodynamics, energy analysis of thermodynamic systems. Approach to equilibrium, entropy and the second law of thermodynamics, analysis of thermodynamic systems. Prerequisite or concurrent registration: Ap S 59. (Fall)

- 134 Dynamics of Linear Systems (3)**
Vibration of single- and multiple-degree of freedom linear systems, transient and steady-state analysis, vibration of distributed parameter systems, and solution by numerical methods. Prerequisite: Ap S 59, 114. (Spring)
- 148 Thermodynamic Analysis (3)**
Application of thermodynamics to engineering systems, irreversibility and availability, thermodynamic potentials and criteria of equilibrium. Analysis of thermodynamic cycles; power and refrigeration cycles, air-standard cycles; nonreactive gas mixtures; thermodynamics of reactive mixtures. Prerequisite: ME 131. (Spring)
- 152 Mechanical Engineering Laboratory (2)**
Emphasis on experimental projects involving problem definition, analysis, data acquisition and reduction, and the formal report; design of new experiments or modification of existing experiments in the mechanical, fluid, and thermal areas is encouraged. Prerequisite: ME 120. (As arranged)
- 155 Compressible Fluid Flow (3)**
Basic laws of compressible fluid flow, with application to nozzles, pipe flow, and fluid machinery; introduction to thin airfoil theory. Prerequisite: ME 126, 131. (Fall)
- 161 Advanced Dynamics (3)**
Review of rigid body dynamics and Euler's equations; balancing of rotating shafts; motion about a fixed point, Euler's angles; spinning top and the theory of the gyroscope; Lagrange's equations for particles, rigid bodies, and systems; introduction to kinematic analysis and synthesis of mechanisms. Prerequisite: ME 134. (Fall)
- 171 Mechanics of Deformable Solids I (3)**
Introduction to theory of elasticity. Derivation of basic equations; torsion and pure bending of slender members of arbitrary cross section, membrane analogy; two-dimensional problems; Airy stress function, stress concentrations; minimum energy principles. Prerequisite: CE 120. (Fall)
- 172 Mechanics of Deformable Solids II (3)**
Theory of plasticity. Stress and strain deviators; invariants, criteria for yielding; lodes variables; plastic stress-strain relations; stresses in elasto-plastic tubes; twisting of elasto-plastic bars; basic concepts of slip line fields; introduction to creep. Prerequisite: CE 120. (As arranged)
- 180 Propulsion (3)**
Basic principles of operation and performance of propulsion systems—including turbojet, turboprop, turbofan, and ramjet—gas turbines and compound engines; combustion chamber processes; liquid and solid propellant chemical rockets. Prerequisite: ME 148, 155. (Spring)
- 187 Heat Transfer Theory (3)**
Steady- and unsteady-state heat conduction; analytical, analog, and numerical solutions. Convective heat transfer, boundary layer approach, analogy between heat and momentum transfer; thermal radiation, heat

transfer by radiation between surfaces; design and selection of heat exchangers. Prerequisite: Ap S 114, ME 126. (Fall)

191 Mechanical Design (3)

(This course, together with ME 193, replaces ME 191-92)

Introduction to design concept, selection of materials, and strength of mechanical elements; design of machine components such as shafts, springs, bearings, gears, couplings, screws, and related mechanical components. Prerequisite: senior status. (Fall)

193 Engineering Systems Design (3)

(This course, together with ME 191, replaces former ME 191-92 Mechanical Design I-II)

Principles of creative design and systems design concept; computer-aided design; design project involving the complete design of a mechanical engineering device. Prerequisite: ME 191. (Spring)

194 Energy Conversion (3)

Principles of steady-state energy conversion; basic ideas of quantum physics and introduction to semiconductors; analyses of thermoelectric, photovoltaic, thermionic, and magnetohydrodynamic generators and fuel cells. Prerequisite: EE 20, ME 148. (Spring)

198 Research (1 to 3)

Applied research and experimentation projects, as arranged. Prerequisite: junior or senior status. (Fall and spring)

GRADUATE COURSES

215 Theory of Vibrations (3)

Damped and undamped natural vibrations, transient response and response to harmonic and periodic excitation, natural vibration of discrete and continuous systems; integral formulation of eigenvalue problems, response by modal analysis, approximate methods, influence of secondary effects and constraints, damped systems. Prerequisite: approval of Department. (Fall)

218 Design of Floating and Submerged Marine Vehicles (3)

Consideration of interaction between hydrodynamics, propulsion, and configuration aspects of design of floating structures and vehicles; effects of submergence and deep submergence; hydrofoil and vertical jet action; structural considerations. Prerequisite: EM 228. (1971-72 and alternate years: spring)

221 Intermediate Fluid Mechanics (3)

The continuum, kinematics of fluids; stress tensor, strain and rate-of-strain tensor; fundamental equations of the flow of viscous compressible fluids; Laplace's equations; source, sink, and doublet; vortices, Biot-Savart theorem and the flow field of a vortex; spherical and cylindrical harmonics; methods of singularity distributions, complex-variable methods; laminar flow of viscous incompressible fluids; boundary layer concept. Prerequisite: approval of Department. (Fall)

227 Viscous Flow (3)

Exact solutions of Navier-Stokes equations; the small Reynolds number approximations, laminar boundary layer theory and the techniques for its solution, stability of laminar flows; Reynolds theory of turbulent stresses, applications to internal and external flows, turbulent boundary layer theory; applications to heat transfer problems; flow separation. Prerequisite: Ap S 213; ME 221 or equivalent. (1971-72 and alternate years: fall)

231 Hydrodynamics (3)

Irrotational axisymmetric and planar flow problems, circulation and lift, lifting line theory, slender body theory. Introduction to gravity waves, body hydrodynamics, and incompressible jets. Prerequisite: Ap S 211, ME 221. (Spring)

235 Compressible Flow (3)

Thermodynamics and physical properties of gases, fundamental equations of a compressible inviscid fluid, small perturbation theory, expansions in Mach number and thickness parameters, second-order shock shapes, role of entropy in supersonic flow, shock wave interactions, hodograph transformation, Kármán-Tsien and other model gases, conical flows, transonic flow theory, method of characteristics, rotational nonisentropic flows. Prerequisite: Ap S 213; ME 221 or equivalent. (1970-71 and alternate years: fall)

280 Advanced Thermodynamics (3)

Statistical significance of the entropy concept, conditions of equilibrium, equilibrium of heterogeneous systems. Application of thermodynamic formalism to magnetic, electric, and solid systems; equilibrium of ionized gases; the Nernst postulate and the third law of thermodynamics. Prerequisite: graduate status. (Fall)

281 Nonequilibrium Thermodynamics (3)

Limitations of equilibrium thermodynamics, entropy production, phenomenological equations and linear laws; postulates of nonequilibrium thermodynamics, formulation of the equations of nonequilibrium systems, statistical foundations, stationary nonequilibrium states; selected applications. Prerequisite: ME 280. (1970-71 and alternate years: spring)

***283 Advanced Propulsion Systems (3)**

(Formerly Ap S 245)

General theory of rocket propulsion; thermodynamic fluid flow and heat transfer analysis; performance and systems analysis for space applications. Chemical rocket propulsion; liquid, solid, hybrid rockets; air-breathing propulsion. Theory of combustion stability and efficiency; nuclear propulsion, reactor control theory, criticality, diffusion analysis, and advanced concepts. Basic concepts of electrical propulsion. Current problems in advanced propulsion. Prerequisite: approval of Department. (1971-72 and alternate years: spring)

284 Combustion Processes (3)

Thermodynamics of combustion, chemical kinetics, flame propagation, combustion of liquids and solids, detonation processes. Prerequisite: ME 280. (1971-72 and alternate years: fall)

* Offered at NASA-Langley Research Center; may be offered on campus when arranged.

285 Reaction Kinetics (3)

Theoretical aspects of kinetics of homogeneous and heterogeneous reactions in gaseous and liquid systems. Prerequisite: ME 280. (1970-71 and alternate years: spring)

287 Heat Conduction (3)

(This course, together with ME 288 and 289, replaces former ME 293-94 Heat Transfer I-II)

Conduction of heat through solid, liquid, and gaseous media; formulation and methods of analytical, numerical, and analog solutions; steady two- and three-dimensional problems, problems in unsteady heat conduction; conduction in composite regions. Prerequisite: Ap S 213 or equivalent. (Fall)

288 Convective Heat and Mass Transfer (3)

(This course, together with ME 287 and 289, replaces former ME 293-94 Heat Transfer I-II)

Heat and momentum transfer in laminar and turbulent flow; application of boundary layer theory to problems of forced convection; the laminar boundary layer and similarity solutions; heat convection in turbulent flow; momentum-heat transfer analogy; the influence of temperature-dependent fluid properties; convective heat transfer at high velocities; mass transfer; formulation of a simplified theory; some solutions to the conserved property equation. Prerequisite: ME 221 or equivalent. (Spring)

289 Radiative Heat Transfer (3)

(This course, together with ME 287 and 288, replaces former ME 293-94 Heat Transfer I-II)

Nature of thermal radiation; radiative characteristics of surfaces; thermal radiation within evacuated enclosures; configuration factors algebra; solution methods for the integral equations of radiant interchange; enclosures containing an absorbing and emitting medium; absorbing, emitting, and scattering media; combined radiation, conduction, and convection. Prerequisite: Ap S 214 or equivalent. (Fall)

***290 Kinetic Theory of Gases (3)**

(Formerly Ap S 296)

Equation of state and physical properties for gas composed of discrete particles; relation of kinetic theory to thermodynamics; Maxwell distribution of molecular velocities; Boltzmann H theorem. Molecular interactions, free paths, collision rates, scattering coefficients. Introduction to diffusion, viscosity, heat conduction; imperfect gases; flow of gases at low density. Prerequisite: ME 280. (1971-72 and alternate years: spring)

291-92 Energy Conversion (3-3)

Thermodynamics of energy conversion, duality of matter, semiconductor theory, thermoelectric engines, thermionic converters; magnetohydrodynamic engines, junction diodes, photovoltaic effects, solar cells, free energy fuel cells, conditions of equilibrium, construction of fuel cells. Prerequisite: graduate status. (ME 291: 1971-72 and alternate years—spring. ME 292: 1970-71 and alternate years—fall)

* Offered at NASA-Langley Research Center; may be offered on campus when arranged.

***293 Aerothermochemistry I (3)**

(Formerly Ap S 255)

Thermodynamics of reacting systems, combustion kinetics, conservation equations, transport processes, laminar diffusion flames, laminar premixed flames, aspects of reacting inviscid flows. Prerequisite: approval of Department. (1971-72 and alternate years: fall)

***294 Aerothermochemistry II (3)**

(Formerly Ap S 256)

Additional aspects of reacting inviscid flows, reacting boundary layers, heterogeneous combustion, turbulent flames, numerical methods in aero-thermochemistry. Prerequisite: ME 293 or equivalent. (1971-72 and alternate years: spring)

295 Statistical Thermodynamics (3)

Distribution functions; Boltzmann, Bose-Einstein, and Fermi-Dirac statistics; partition functions, correspondence between classical and statistical thermodynamics. Systems with negligible effects of interparticle forces; perfect gases, perfect electron gas, photon gas. The Debye solid, the Einstein solid. Prerequisite: ME 280. (1971-72 and alternate years: spring)

296 Special Topics in Heat and Mass Transfer (3)

Selected heat and mass transfer problems of current interest such as temperature distribution and heat transfer rate in an ablating solid; heat transfer with boiling, two-phase flow in pipes, heat transfer to liquid metals, thermal contact resistance, heat transfer to non-Newtonian fluids. Prerequisite: approval of Department. (1971-72 and alternate years: fall)

297 Special Topics in Fluid Mechanics (3)

Selected topics in fluid mechanics of current interest, such as rarefied flow, hypersonic leading edge flow, method of series truncation, nonequilibrium wave propagation. Prerequisite: approval of Department. (1970-71 and alternate years: spring)

298 Research (arr.)

Research as arranged. May be repeated for credit. (Fall and spring)

299-300 Thesis Research (3-3)

(Academic year)

315 Hypersonic Flow (3)

Small-disturbance theory, Newtonian theory; constant-density solution, theory of thin shock layers, flow over blunt bodies, hypersonic viscous flow, experimental techniques. Prerequisite: ME 235. (1970-71 and alternate years: fall)

317 Physical Gas Dynamics (3)

Molecular and atomic phenomena in gases, intermolecular forces, specific heats, equation of state for a real gas, dynamics of dissociating gas, radiation. Prerequisite: ME 235; 295 or equivalent. (1971-72 and alternate years: spring)

* Offered at NASA-Langley Research Center; may be offered on campus when arranged.

398 Advanced Reading and Research (arr.)

Limited to students preparing for the Doctor of Science qualifying examination. May be repeated for credit. (Fall and spring)

399 Dissertation Research (arr.)

Limited to Doctor of Science candidates. May be repeated for credit. (Fall and spring)

Measurement Science*

Professor T.J. Carroll (Research)

Adjunct Professors L.A. Guildner, A.G. McNish, T.R. Young, F.K. Harris, D.P. Johnson

Professorial Lecturers Leon Horn, F.E. Washer

UNDERGRADUATE FIELD

Measurement Science (see pages 28-29).

SUBJECT AREAS—UNDERGRADUATE**General Measurement Science**

101-2 Measurement Science

Instrumentation

111 Introductory Instrumentation

112 Instrumentation

Specific Measurements

121 Mechanical Measurement

123 Pressure Measurement

122 Heat Measurement

Laboratory

131 Measurement Laboratory

132 Measurement Projects Laboratory

FIELDS AND AREAS OF CONCENTRATION—GRADUATE**General Measurement Science**

201 Advanced General Metrology

203-4 Probability and Statistics of Metrology

Precise Measurements

242 Precise Microwave Measurements

243 Precise Optical Measurements
244 Precise Electrical Standards

UNDERGRADUATE COURSES**101-2 Measurement Science (3-3)**

Fundamental concepts in measurement science; standards, error, accuracy, precision, measurement, and comparability. Design of experiments. Prerequisite: senior status. (Academic year—evening)

* Staff of instruction for the academic year 1969-70.

111 Introductory Instrumentation (3)

Theory, design, and application of simple transducers; design of instrumentation of one-type systems; analysis and design of simple instrumentation. Prerequisite: EE 20. May be taken for graduate credit. (Fall—evening)

112 Instrumentation (3)

Analysis and design of transducers and instrumentation for measurement in systems containing multiple quantities of one type or mixtures of types. Prerequisite: MeaS 111. May be taken for graduate credit. (Spring—evening)

121 Mechanical Measurement (3)

Precise measurements of mass and length; mechanical and interferometric methods. Prerequisite: senior status. May be taken for graduate credit. (Fall—evening)

122 Heat Measurement (3)

Temperature scales; measurement by resistance thermometry, thermocouples, pyrometry, vapor pressure thermometry; heat transfer quantities and their measurement; calorimeters, flow calorimeters. Prerequisite: senior status. May be taken for graduate credit. (Fall—evening)

123 Pressure Measurement (3)

Experimental techniques for quantitative measurement of pressure; working gages, standards, calibration procedures; methods and apparatus for observations near atmospheric pressure, in the high pressure range, and in the vacuum range. Prerequisite: senior status. May be taken for graduate credit. (Spring—evening)

131 Measurement Laboratory (3)

Design of test and test measurement of various electrical, mechanical, and heat quantities in simple and complex systems. Data treatment and reporting of results. Introduction to quality control operations. Prerequisite: E Ad 115. Prerequisite or concurrent registration: MeaS 101. (Fall—evening)

132 Measurement Projects Laboratory (3)

Individual selected measurement problems of some complexity. Prerequisite: MeaS 131. Prerequisite or concurrent registration: MeaS 102. (Spring—evening)

198 Research (1 to 3)

Applied research and experimentation projects, as arranged. Prerequisite: junior or senior status. (Fall and spring)

GRADUATE COURSES**201 Advanced General Metrology (3)**

Topics in the conceptual, physical, and mathematical aspects of measurement, standards, design for precision measurement, and measurement at extreme values. Prerequisite: graduate status. (Fall—evening)

203-4 Probability and Statistics of Metrology (3-3)

Probability distributions, discrete and continuous distributions; sampling; combinatorial analysis; stochastic processes; conditional probability; correlation; analysis of variance; design and analysis of experiments, Latin Square experiments, factorial experiments, block and lattice design. Prerequisite: E Ad 115 or equivalent. (Academic year—evening)

242 Precise Microwave Measurements (3)

Precise measurement of power, frequency, impedance, wavelength, and attenuation at microwave frequencies; characteristics and Q of resonant devices; calibration of microwave components; design of microwave experiments. Prerequisite: EE 133 or equivalent. (Spring—evening)

243 Precise Optical Measurements (3)

Optical constants of lens systems; aberration; resolving power; illumination in focal plane; image evaluation, magnification, index of refraction; color and color temperature. Prerequisite: graduate status. (Fall—evening)

244 Precise Electrical Standards (3)

Concepts of standards, errors; design of resistance, capacitance and inductance standards; d-c voltage standards; frequency and time standards; dielectric and magnetic materials, attenuation standards, power standards, transfer standards. Prerequisite: EE 160 or equivalent. (Spring—evening)

298 Research (arr.)

Research as arranged. May be repeated for credit. (Fall and spring)

299-300 Thesis Research (3-3)

(Academic year)

398 Advanced Reading and Research (arr.)

Limited to students preparing for the Doctor of Science qualifying examination. May be repeated for credit. (Fall and spring)

399 Dissertation Research (arr.)

Limited to Doctor of Science candidates. May be repeated for credit. (Fall and spring)

Required Core Curriculum Courses Offered by Columbian College of Arts and Sciences

For convenience, descriptions of required courses in the core curriculum which are offered by Columbian College of Arts and Sciences are listed here. See the *Undergraduate and Graduate Catalogue* for elective courses in the humanities and social sciences.

CHEMISTRY

13 General Chemistry (4)

Lecture (3 hours), laboratory (2 hours), recitation (1 hour). Matter, atomic structure, chemical bonding; chemical equations; oxygen, hydrogen,

acids, and bases; chemical equilibrium; liquid and solid states; periodic table; electrochemistry; organic chemistry. Prerequisite: Math 31, Phys 2. Laboratory fee, \$18. (Fall—day)

ENGLISH

*1 English Composition (3)

Analysis and practice of expository techniques with emphasis on unity, development, organization, and coherence; library research procedure. (Fall and spring—day and evening)

*1x English Composition (3)

Intensive course in English grammar and composition for students inadequately prepared for Engl 1. Begins with detailed instruction, drill, and exercises in basic structure of the English language and in writing paragraphs; continues with content of Engl 1. Engl 1x meets five hours a week and carries 3 semester hours of credit. Total fee, \$229 (tuition fee of \$204 plus additional fee of \$25). (Fall—day and evening; spring—evening)

MATHEMATICS

†30 Precalculus (3)

Logic, set theory, real number system, inequalities, basic analytic geometry, functions and relations. Polynomial, trigonometric, logarithmic, and exponential functions. Prerequisite: Math 3 and 6; or one and one-half years of high school algebra; one year of high school geometry, and one-half year of high school trigonometry; or equivalent. (Fall and spring—day and evening)

31 Calculus of One Variable (3)

Differentiation and integration of algebraic and elementary transcendental functions, with simple applications. Prerequisite: Math 30 or equivalent. (Fall and spring—day and evening)

32 Calculus of Several Variables (3)

Partial derivatives, multiple integrals, infinite series. Prerequisite: Math 31. (Fall and spring—day and evening)

33 Calculus of Vector Functions (3)

Elementary linear algebra, vectors, and matrices. Vector calculus, implicit function theory. Prerequisite: Math 32. (Fall and spring—day and evening)

* Students whose College Board English Composition Achievement Test scores suggest inadequate preparation may be assigned to Engl 1x or may be tested in vocabulary, spelling, grammar, standard usage, and writing skill, before placement in either Engl 1x or 1. Students whose College Board scores indicate marked superiority will be allowed to waive the Engl 1 requirement. Waiving this requirement does not entitle students to any semester hours of credit.

† Students who are adequately prepared may take a waiver examination for Math 30. Passing this waiver examination does not entitle students to any semester hours of credit.

PHYSICS***1 General Physics (4)**

Topics in classical physics which form a foundation for modern physics. Prerequisite: two years of college preparatory mathematics or concurrent registration for Math 6. Laboratory fee, \$11. (Fall—day and evening; spring—day)

2 Introduction to Modern Physics (4)

(Formerly General Physics)

Selected topics in modern physics, including electromagnetic phenomena. Prerequisite: Phys 1 or equivalent. Phys 1 may be waived on the basis of the College Entrance Examination Board Achievement Test or by a departmental examination prior to registration. Laboratory fee, \$11. (Fall—day; spring—day and evening)

31-32 Introduction to Theoretical Physics (2-2)

Theoretical structure of physics, emphasis on appropriate analytical techniques. Prerequisite: two semesters of calculus and Phys 2. (Academic year—as arranged)

51-52 Introduction to Experimental Physics (2-2)

Experiments and lectures on the basic phenomena of physics and techniques of experimentation. Prerequisite: Phys 2 and two semesters of calculus. Material fee, \$11 a semester. (Academic year—day and evening)

* Students who are adequately prepared may take a waiver examination for Phys 1. Passing this waiver examination does not entitle students to any semester hours of credit.

Offered by **Columbia College of Arts and Sciences**

CHEMISTRY

FACULTY AND STAFF OF INSTRUCTION*

EMERITUS

Benjamin Carpenter Cruickshanks, *Professor Emeritus of Mechanical Engineering*
B.S. in M.E. 1920, George Washington University

ACTIVE

Abd-elfattah Abd-alla, *Assistant Professor of Engineering and Applied Science*
B.S. 1960, Ain Shams University, Egypt; M.S. 1963, Alexandria University, Egypt; Ph.D. 1969, University of Maryland

Melvin Dayne Aldrich, *Assistant Professorial Lecturer in Engineering*
B.S. 1963, West Virginia University; M.S. 1965, D.Sc. 1968, University of Virginia

Galip Mehmet Arkilic, *Professor of Applied Science; Acting Assistant Dean of the School of Engineering and Applied Science*
B.M.E. 1946, Cornell University; M.S. 1947, Illinois Institute of Technology; Ph.D. 1954, Northwestern University

Donald Oliver Baechler, *Assistant Professorial Lecturer in Engineering*
B.E.E. 1960, M.S. in Engr. 1964, George Washington University

Constantine Balanis, *Assistant Professorial Lecturer in Engineering*
B.S. in E.E. 1964, Virginia Polytechnic Institute; M.E.E. 1966, University of Virginia; Ph.D. 1969, Ohio State University

Richard Walker Barnwell, *Assistant Professorial Lecturer in Engineering*
B.S. 1961, M.S. 1962, Auburn University; Ph.D. 1968, Virginia Polytechnic Institute

Lewis Horrigan Blakey, *Assistant Professorial Lecturer in Engineering*
B.S. in C.E. 1954, University of Notre Dame; M.S. in Engr. 1962, George Washington University

Matthew Edward Brady, *Associate Professorial Lecturer in Engineering*
B.S. in E.E. 1945, University of Nebraska; M.Engr. 1959, University of California, Los Angeles

Edward Howard Braun, *Associate Professor of Engineering and Applied Science*
B.A. 1948, M.A. 1950, Columbia University

Miles Melvin Bruce, *Assistant Professorial Lecturer in Engineering*
B.S. 1962, Clemson University; M.S. 1965, University of Virginia

Robert Wayne Bublitz, *Associate Professorial Lecturer in Engineering*
B.S. 1962, M.S. 1963, Oklahoma State University

John Dennis Buckley, *Assistant Professorial Lecturer in Engineering*
B.S. 1950, St. Lawrence University; B.S. 1959, M.S. 1961, Clemson University; Ph.D. 1968, Iowa State University of Science and Technology

*Professors, Adjunct Professors, Associate Professors, Assistant Professors, and Instructors constitute the Faculty. The President of the University, the Vice President for Academic Affairs, the Registrar of the University, and the Director of Admissions of the University are ex officio members of the Faculty. This listing of the Faculty and Staff of Instruction is for the academic year 1969-70.

- Fausto Mario Calabria, *Assistant Professorial Lecturer in Engineering*
Ph.D. 1960, University of Rome, Italy; Ph.D. 1964, Aerospace Engineering School, Italy
- Thomas Joseph Carroll, *Research Professor of Applied Science*
B.A. 1932, University of Pittsburgh; Ph.D. 1936, Yale University
- Mehmet Izzi Celebiler, *Assistant Professorial Lecturer in Engineering*
M.S. 1963, Istanbul Technical University, Turkey; Ph.D. 1968, University of Pennsylvania
- James Kyle Cooper, *Assistant Professorial Lecturer in Engineering*
B.A. 1958, University of Kentucky; M.D. 1962, Vanderbilt University
- Paul Arthur Crafton, *Professor of Engineering and Applied Science*
B.M.E. 1944, City College, New York; M.S. 1950, Ph.D. 1956, University of Maryland
- Robert Emmet Cronin, *Professor of Engineering and Applied Science*
B.S. 1925, U.S. Naval Academy; M.S. 1932, Columbia University
- William Fay Crosswell, *Professorial Lecturer in Engineering*
B.S. 1952, Virginia Military Institute; M.S. 1954, Air Force Institute of Technology
- John Edward Duberg, *Adjunct Professor of Engineering*
B.S. 1938, Manhattan College; M.S. 1940, Virginia Polytechnic Institute; Ph.D. 1948, University of Illinois
- John Eftis, *Associate Professor of Engineering and Applied Science*
B.C.E. 1952, City College, New York; M.S. in C.E. 1958, Columbia University; D.Sc. 1967, George Washington University
- Marvin Eisenberg, *Associate Professor of Engineering and Applied Science*
B.S. in E.E. 1953, University of Miami; M.S. in Engr. 1954, Ph.D. 1961, University of Florida
- Wayne Douglas Erickson, *Associate Professorial Lecturer in Engineering*
B.S. 1954, M.S. 1955, Michigan State University; M.S. 1958, D.Sc. 1962, Massachusetts Institute of Technology
- Charles Feldman, *Adjunct Professor of Engineering*
B.A. 1944, M.A. 1949, Johns Hopkins University; Ph.D. 1952, University of Paris, France
- Joseph Foa, *Professor of Engineering and Applied Science*
Dr.Ing. (M.E.) 1931, Polytechnic Institute of Torino, Italy; Dr.Ing. (A.E.) 1933, University of Rome, Italy
- Raymond Richard Fox, *Professor of Engineering and Applied Science*
B.S. in C.E. 1949, M.S. in C.E. 1952, University of Washington
- Robert William Fralich, *Associate Professorial Lecturer in Engineering*
B.Ae.E. 1947, University of Cincinnati; M.Ae.E. 1952, University of Virginia; Ph.D. 1963, Virginia Polytechnic Institute
- Alfred Freudenthal, *Professor of Civil and Materials Engineering*
C.E. 1929, D.Sc. 1930, Prague Institute of Technology, Czechoslovakia; M.S. 1930, Prague University, Czechoslovakia
- Clifford Lynn Fricke, *Associate Professorial Lecturer in Engineering*
B.S. 1947, University of Nebraska; M.S. 1956, University of Virginia; Ph.D. 1967, Virginia Polytechnic Institute
- William Henry Fuhr, *Assistant Professorial Lecturer in Engineering*
B.S. in E.E. 1954, M.S. 1957, Tulane University of Louisiana
- Robert Earle Fulton, *Professorial Lecturer in Engineering*
B.S. 1953, Auburn University; M.S. 1958, Ph.D. 1960, University of Illinois
- I. Edward Garrick, *Adjunct Professor of Engineering*
B.S. 1930, University of Chicago
- Michael Paul Gaus, *Associate Professorial Lecturer in Engineering*
B.S. 1954, M.S. 1956, Ph.D. 1959, University of Illinois
- Donald Gross, *Associate Professor of Engineering and Applied Science*
B.S. 1956, Carnegie-Mellon University; M.S. 1959, Ph.D. 1962, Cornell University
- Leslie Arnold Guildner, *Adjunct Professor of Engineering*
B.A. 1948, M.A. 1949, University of Nebraska; Ph.D. 1954, Massachusetts Institute of Technology

- Carl Harris, *Associate Professorial Lecturer in Engineering*
B.S. 1960, Queens College, New York; M.S. 1962, Ph.D. 1966, Polytechnic Institute of Brooklyn
- Forest Klaire Harris, *Adjunct Professor of Engineering*
B.A. 1921, M.S. 1923, University of Oklahoma; Ph.D. 1932, Johns Hopkins University
- Robert Bernard Heller, *Professor of Engineering and Applied Science*
B.S. 1946, M.S. 1948, Ph.D. 1951, St. Louis University
- Guenther Hintze, *Research Professor of Electrical Engineering*
B.S. 1927, M.S. 1929, Technological College, Breslau, Germany
- Leon Horn, *Professorial Lecturer in Engineering*
B.S. 1948, M.S. 1949, Wayne State University
- James Shin-Li Huang, *Assistant Professor of Engineering and Applied Science*
B.A. 1956, National Taiwan University; B.S. in E.E. 1961, Ohio University; M.S. in E.E. 1963, University of Vermont
- Francis Joseph Hughes, *Assistant Professorial Lecturer in Engineering*
B.S. 1960, University of Miami; M.S. in Engr. 1965, George Washington University
- Raul Ricardo Hunziker, *Professorial Lecturer in Engineering*
M.S. in Ae.E. 1948, M.S. 1951, Ph.D. 1955, National University of La Plata, Argentina
- Barry Ira Hyman, *Associate Professor of Applied Science*
B.Ae.E. 1958, Rensselaer Polytechnic Institute; M.S. 1961, St. Louis University; Ph.D. 1965, Virginia Polytechnic Institute
- Donald Herbert Jermain, *Associate Professorial Lecturer in Engineering*
B.S. 1942, University of Maryland; M.S. 1960, Stevens Institute of Technology
- Daniel Palmer Johnson, *Adjunct Professor of Engineering*
B.S. 1930, McPherson College; M.A. 1933, University of Kansas; Ph.D. 1939, University of Wisconsin
- Kenneth Johnson, *Professor of Engineering Administration*
B.A. 1931, Indiana State University; Ph.D. 1937, Purdue University
- Douglas Linwood Jones, *Assistant Professor of Engineering and Applied Science*
B.M.E. 1963, M.S. in Engr. 1965, George Washington University
- Walter Kurt Kahn, *Professor of Engineering and Applied Science*
B.E.E. 1951, Cooper Union; M.E.E. 1954, D.E.E. 1960, Polytechnic Institute of Brooklyn
- John Kaye, *Professor of Engineering and Applied Science*
B.S. in M.E. 1939, M.S. in M.E. 1948, California Institute of Technology
- Ali Muhlis Kiper, *Associate Professor of Engineering*
M.S. in M.E. 1950, Technical University of Istanbul, Turkey; M.S. in M.E. 1954, Ph.D. 1956, Purdue University
- Edwin Thomas Kruszewski, *Associate Professorial Lecturer in Engineering*
B.S. 1942, Carnegie-Mellon University; M.S. 1956, Ph.D. 1968, Virginia Polytechnic Institute
- Nicholas Kyriakopoulos, *Assistant Professor of Engineering*
B.E.E. 1960, M.S. in Engr. 1963, D.Sc. 1968, George Washington University
- George Koo Lea, *Assistant Professor of Applied Science*
B.M.E. 1960, George Washington University; Ph.D. 1966, Virginia Polytechnic Institute
- Francis Scott LeBeau, *Assistant Professorial Lecturer in Engineering*
B.S.(E.E.) 1966, George Washington University; M.A. 1967, Harvard University
- Robert Steven Ledley, *Research Professor of Engineering*
D.D.S. 1948, New York University; M.A. 1949, Columbia University
- Harold Liebowitz, *Professor of Engineering and Applied Science; Dean of the School of Engineering and Applied Science*
B.Ae.E. 1944, M.Ae.E. 1946, D.Ae.E. 1948, Polytechnic Institute of Brooklyn
- William Henry Marlow, *Professor of Applied Science*
B.S. 1947, St. Ambrose College; M.S. 1948, Ph.D. 1951, University of Iowa
- Warren Mason, *Research Professor of Engineering*
B.S. 1921, University of Kansas; M.A. 1924, Ph.D. 1928, Columbia University

Gerald Robert McNichols, *Lecturer in Engineering*

B.S. 1965, Case Western Reserve University; M.S. 1966, University of Pennsylvania

Alvin Greene McNish, *Adjunct Professor of Engineering*

B.A. 1924, M.A. 1931, George Washington University

Arnold Charles Meltzer, *Associate Professor of Engineering and Applied Science*

B.S. in Engr. 1958, M.S. in Engr. 1961, D.Sc. 1967, George Washington University

Frederic Alan Miercort, *Associate Professorial Lecturer in Engineering*

B.S. 1959, Massachusetts Institute of Technology; M.A. 1959, Harvard University; M.S. 1962, University of Colorado; Ph.D. 1968, Stanford University

Maurice Morin, *Assistant Professorial Lecturer in Engineering*

B.S. 1955, Boston University

John Henry O'Hara, *Assistant Professorial Lecturer in Engineering*

B.S. 1960, University of Arizona; M.S. 1962, University of Pennsylvania; Ph.D. 1968, Catholic University of America

Walter Olstad, *Associate Professorial Lecturer in Engineering*

B.S. 1954, Brown University; M.S. 1958, Virginia Polytechnic Institute; Ph.D. 1967, Harvard University

Nicholas Perrone, *Visiting Research Professor of Engineering*

B.A.E. 1951, M.S. 1953, Ph.D. 1958, Polytechnic Institute of Brooklyn

*Charles Edward Pinkus, *Assistant Professor of Engineering Administration*

B.A., B.S. 1960, Rutgers, the State University; M.S. 1962, Cornell University

E. Neville Pugh, *Associate Professor of Applied Science*

B.S. 1956, Ph.D. 1959, University of Wales

Manuel Jack Queijo, *Associate Professorial Lecturer in Engineering*

B.S. 1944, Worcester Polytechnic Institute; M.S. 1954, University of Virginia; Ph.D. 1963, Virginia Polytechnic Institute

Samuel Joseph Raff, *Associate Professorial Lecturer in Engineering*

B.S. 1943, City College, New York; M.S. 1950, Ph.D. 1957, University of Maryland

John Philip Raney, *Associate Professorial Lecturer in Engineering*

B.S. 1954, M.S. 1957, Ph.D. 1959, Purdue University

Joseph John Rocchio, Jr., *Assistant Professorial Lecturer in Engineering*

B.S., M.S. 1958, Massachusetts Institute of Technology; Ph.D. 1966, Harvard University

Derrill Conway Rohlf, *Assistant Professorial Lecturer in Engineering*

B.E.E. 1955, M.S. in Engr. 1959, George Washington University

Louis Samuel Rotolo, *Associate Professorial Lecturer in Engineering*

B.S. in E.E. 1951, University of Michigan; M.E.A. 1961, George Washington University

Stephen Howard Sandler, *Lecturer in Engineering*

B.S. 1962, New York University; M.S. 1966, Polytechnic Institute of Brooklyn

Andrew Robert Saunders, *Assistant Professorial Lecturer in Engineering*

Diplom Chem.E. 1947, Technical University of Budapest, Hungary; Ph.D. 1959, University of Maryland

Peter Hans Sawitz, *Adjunct Associate Professor of Applied Science*

B.S. in E.E. 1943, Virginia Polytechnic Institute; M.S. in E.E. 1946, Ohio State University

George Saxton, *Assistant Professorial Lecturer in Engineering*

B.E.E. 1965, George Washington University

Victor Selman, *Associate Professorial Lecturer in Engineering*

B.A. 1956, New York University; M.S. 1960, Stevens Institute of Technology; D.Sc. 1969, George Washington University

Bhupendraprasad Shah, *Assistant Professorial Lecturer in Engineering*

B.E. 1956, Baroda University, India; M.E. 1958, Indian Institute of Science, Bangalore, India; M.E.E. 1961, Syracuse University

Presson Scott Shane, *Professor of Engineering Administration*

B.S. in Ch.E. 1941, University of Kansas; M.S. 1946, Massachusetts Institute of Technology

* On leave of absence 1969-70.

- George Walter Shelhorse, *Professorial Lecturer in Law*
LL.B. 1951, George Washington University
- Nozer Darabsha Singpurwalla, *Associate Professor of Applied Science*
B.S. 1959, B.V. Bhoomraddi College of Engineering and Technology, Hubli, India; M.S. (I.E.) 1964, Rutgers, the State University; Ph.D. 1968, New York University
- *Nicholas Arthur Sloan, *Assistant Professor of Engineering*
B.S. 1956, University of Maryland; M.S. 1967, George Washington University
- Herbert Ernest Smith, *Professor of Engineering and Applied Science*
B.S. 1930, C.E. 1932, City College, New York; M.S. 1936, Ph.D. 1940, New York University
- Joseph Borden Smith, Jr., *Assistant Professor of Engineering and Applied Science*
B.S. in E.E. 1933, University of Florida; M.E.A. 1956, D.Sc. 1966, George Washington University
- Robert Allen Smith, *Assistant Professorial Lecturer in Engineering*
B.S. in M.E. 1960, M.S. in I.E. 1964, Wayne State University; Ph.D. 1967, Arizona State University
- Leo Douglas Staton, *Associate Professorial Lecturer in Engineering*
B.S. 1959, Ph.D. 1968, Virginia Polytechnic Institute
- Theodore George Toridis, *Associate Professor of Engineering and Applied Science*
B.S. 1954, Robert College, Turkey; M.S. 1961, Ph.D. 1964, Michigan State University
- Vallobh Vimolvanich, *Assistant Professor of Engineering*
B.E. 1963, Chulalongkorn University, Thailand; M.S. 1965, University of California, Berkeley; Ph.D. 1968, University of California, Davis
- John Waller, *Assistant Professorial Lecturer in Engineering*
B.S. 1959, Rockhurst College; M.S. 1962, Ph.D. 1966, University of Notre Dame
- Carl Hugo Walther, *Professor of Engineering and Applied Science; Assistant Vice President for Academic Affairs*
B.E. 1931, M.C.E. 1933, Johns Hopkins University; Ph.D. 1967, University of Maryland
- Shou-Ling Wang, *Associate Professorial Lecturer in Engineering*
B.S. 1946, St. John's University, China; M.E. 1948, Yale University; Ph.D. 1952, University of Illinois
- Francis Earl Washer, *Professorial Lecturer in Engineering*
B.A. 1928, Cornell University; M.S. 1930, Ph.D. 1936, Purdue University
- John Lindsey Whitesides, Jr., *Assistant Research Professor of Engineering*
B.S. 1965, Ph.D. 1968, University of Texas at Austin
- Paul Willis, *Assistant Professorial Lecturer in Engineering*
B.S. 1952, Southern Methodist University; B.E.E. 1953, M.E.E. 1962, Polytechnic Institute of Brooklyn
- Robert James Wilson, *Research Professor of Applied Science*
B.A. 1929, Westminster College, Pennsylvania; M.A. 1941, Ed.D. 1951, Columbia University
- William Arnold Wood, *Research Professor of Materials Science*
B.S. 1927, B.S. 1928, M.S. 1929, D.Sc. 1935, Manchester University, England
- Michael Yachnis, *Associate Professorial Lecturer in Engineering*
B.S. 1943, Military College, Athens, Greece; B.S. in C.E. 1951, Military Technical Training College, Athens, Greece; M.S. in Engr. 1956, M.E.A. 1962, D.Sc. 1968, George Washington University
- Edward Carson Yates, Jr., *Associate Professorial Lecturer in Engineering*
B.S. 1948, M.S. 1949, North Carolina State University at Raleigh; M.S. 1953, University of Virginia; Ph.D. 1959, Virginia Polytechnic Institute
- Theodore Richard Young, *Adjunct Professor of Engineering*
B.S. 1949, University of Rochester

* On leave of absence 1969-70.

Shao Wen Yuan, *Professor of Engineering and Applied Science*

B.S. 1936, University of Michigan; M.S. 1937, Ph.D. 1941, California Institute of Technology;
Ae.E. 1939, Stanford University

Paul Zilczer, *Professorial Lecturer in Engineering*

M.S. 1932, D.Sc. 1933, University of Budapest, Hungary

ASSISTANTS IN INSTRUCTION

Chafe Khaled Abouricheh, *Graduate Research Assistant in Electrical Engineering*

B.S. (E.E.) 1968, George Washington University

Ernesto Gonzaga, *Graduate Teaching Fellow in Electrical Engineering*

B.S. in E.E. 1964, Polytechnic Colleges of the Philippines

Michael George Harris, *Graduate Teaching Fellow in Electrical Engineering*

B.S. in E.E. 1964, University of Maryland; M.S. 1968, George Washington University

Khalilollah Khozeimeh, *Graduate Teaching Fellow in Engineering Mechanics*

B.C.E. 1965, M.S. 1967, George Washington University

Arthur Webster Lucas, *Graduate Research Assistant in Engineering Mechanics*

B.S. (M.E.) 1969, George Washington University

William Thomas Packard, *Graduate Research Assistant in Engineering Mechanics*

B.S. (M.E.) 1969, George Washington University

Yigal Pisetzky, *Graduate Teaching Fellow in Engineering Mechanics*

B.S. (M.E.) 1969, George Washington University

John Moody Saunders, *Graduate Research Assistant in Electrical Engineering*

B.E.E. 1966, George Washington University

Arthur Zachai, *Graduate Research Assistant in Electrical Engineering*

B.S. in E.E. 1965, Case Western Reserve University

Robert Mayer Zeskind, *Graduate Teaching Fellow in Electrical Engineering*

B.S. in Engr. 1965, Case Western Reserve University

ANNUAL ISSUES OF THE UNIVERSITY BULLETIN

Requests for the following publications must include your zip code and should be addressed as indicated.

COLLEGE OF GENERAL STUDIES, Dean of the College

NATIONAL LAW CENTER, Dean of the Center

SCHOOL OF ENGINEERING AND APPLIED SCIENCE, Dean of the School

UNDERGRADUATE AND GRADUATE CATALOGUE (Arts and Sciences, Education, Government and Business, Public and International Affairs), Office of Admissions

SCHOOL OF MEDICINE, Admissions Office, School of Medicine

SUMMER SESSIONS, Dean of the Summer Sessions

SCHEDULE OF CLASSES: FALL AND SPRING SEMESTERS, Registrar

SCHEDULE OF CLASSES: SUMMER SESSIONS, Dean of the Summer Sessions

APPENDIX: RECENTLY ESTABLISHED REGULATIONS

THE FOLLOWING UNIVERSITY REGULATIONS are under review and may be subject to change in connection with the establishment of judicial processes. Bulletins and handbooks incorporating any changes will be issued as appropriate.

The following resolution, submitted by the University Senate, was approved by the University's Board of Trustees on October 19, 1968:

Whereas, safety and order are essential preconditions of the learning process, and indeed of the very concept of a university; and

Whereas, The George Washington University is committed to protection of free speech and freedom of assembly, and to safeguarding the right of lawful protest on campus; and is committed equally to maintaining the peace and safety of the campus, in the knowledge that all rights are in jeopardy when violence and civil disorder prevail over law and reason;

Now, therefore, be it resolved by the Senate of The George Washington University: that in the event a demonstration at this University exceeds the bounds of free assembly and lawful advocacy, and demonstrators are engaging in unlawful acts which cause or imminently threaten injury to persons or property, or which obstruct or interfere with normal and necessary University activities, this body affirms the authority of the President, or other University officials designated to act in his absence, to take such reasonable steps, if possible after consultation with the Chairman of the Executive Committee of the University Senate and the President of the Student Body, as are required to restore and preserve order; including, if deemed necessary and appropriate, suspension of students or faculty engaging in such acts, and use of such law enforcement personnel as are needed to effect the removal, arrest, and prosecution of law violators. Any such suspension shall be reviewed by an appropriate tribunal as soon after order is restored as is practicably possible.

The following was approved by the University's Board of Trustees on October 19, 1968:

Any student suspended from The George Washington University on the grounds of exceeding the bounds of free assembly and lawful advocacy shall have his suspension reviewed by the Hearing Committee on Student Affairs of The George Washington University as soon after order is restored as is practicably possible.

The following resolution, submitted by the Student Life Committee, was approved by the University's Board of Trustees on October 19, 1968:

Be it resolved that The George Washington University: affirms its traditional commitment to freedom of expression (a) by continuing to permit business and government organizations which are recruiting employees to conduct their activities at designated places on campus, and (b) by placing no obstacle to students who may wish to protest the presence of such recruiters, provided, however, that such protest shall be orderly and shall not impede or disrupt the recruiter in his activities.

The University affirms its place as a forum for the free exchange of ideas (a) by assuring that guests invited to speak on this campus at duly scheduled meetings shall have the right to appear and to be heard, and (b) by sanctioning the freedom of students to express dissent from the views of the speaker, provided, however, that that expression of dissent be orderly and nonobstructive.

The University distinguishes between orderly protest and resistance-by-obstruction; it accepts the former as a legitimate expression of dissent while rejecting the latter as an abridgement of the freedoms of the individuals who may be its object.

The following was approved by the University's Board of Trustees on October 19, 1968:

The George Washington University is opposed to discrimination based on race, color, or creed. Such discrimination may have appeared in campus organizations in the past. In the future, however, no organization can be recognized or supported by the University unless it provides continued assurance of nondiscrimination in membership practices and in intent, considered adequate by relevant committees and officers of the University.

The following was approved by the University's Board of Trustees on October 19, 1968:

The University cannot condone violations of law, including violation of those laws which proscribe possession, use, sale, or distribution of certain drugs. Members of the academic community should know that administrative action, which may include dismissal from the residence halls, revocation of other privileges, or suspension or dismissal from the University, may be taken in order to protect the interests of the University and the rights of others.

The Board of Trustees reaffirms the responsibility of the President and the Faculty to continue to implement this policy.

The following resolution, submitted by the University Senate, was approved by the University's Board of Trustees on January 16, 1969:

Be it resolved by the Senate of The George Washington University: Any member of the University (including as members of the University all persons having a formal connection with the University)

(a) who engages in conduct that unreasonably obstructs teaching, research, and learning, or

(b) who unreasonably obstructs free access to members or guests of the University or to University buildings, or

(c) who disobeys general regulations of the University, or

(d) who damages University property or injures members or guests of the University,

may be punished for his conduct by dismissal from the University, or by some lesser disciplinary action, through procedures established within the University for the government of its members.

In order to insure due process, any student subject to dismissal or other disciplinary action on the grounds of violating any of the premises of this resolution shall have, at his discretion, the right of review of the action by the University Hearing Committee on Student Affairs.

CORRESPONDENCE DIRECTORY

Detailed information may be obtained by addressing inquiries as indicated below. For any information not included here, please write to the Office of Admissions. Mailing address for all University offices unless otherwise indicated is The George Washington University, Washington, D.C. 20006.

Information concerning courses of instruction, programs, and faculties of the several colleges and schools will be found in separate issues of the University Bulletin, which are listed on page 134. Your zip code is essential for mailing catalogues.

Admission	
Graduate	
Arts and Sciences.....	Dean of The Graduate School of Arts and Sciences
Education.....	Dean of The School of Education
Engineering and Applied Science.....	Dean of The School of Engineering and Applied Science
Accounting, Business Administration, Business and Economic Statistics, Health Care Administration, International Business, Personnel Administration, Public Administration, Urban and Regional Planning	Dean of The School of Government and Business Administration
International Affairs and Public Affairs.....	Dean of The School of Public and International Affairs
Law.....	Dean of The National Law Center
School of Medicine.....	1331 H Street, Washington, D.C. 20005
Undergraduate.....	Office of Admissions
Alumni Association.....	Alumni Office
Medical Alumni Association.....	1331 H Street, Washington, D.C. 20005
Financial Aid.....	Student Financial Aid Office
Foreign Students.....	Adviser to International Students
Gifts and Bequests.....	Development Program
Housing.....	Housing Administrator
Off-campus and Noncredit Courses.....	Dean of The College of General Studies
Student Employment.....	Student and Alumni Career Services Office
Summer Sessions.....	Dean of The Summer Sessions
Transcripts of Records.....	Registrar
Veterans Education.....	Registrar

COLLEGES AND SCHOOLS—DEGREE PROGRAMS

COLUMBIAN COLLEGE OF ARTS AND SCIENCES: Associate in Arts (A.A.), Bachelor of Arts (B.A.), Bachelor of General Studies (B.Gen.Std.), Bachelor of Science (B.S.), Bachelor of Science in Environmental Health (B.S. in Env.Health), Bachelor of Science in Geodetic and Cartographic Science (B.S. in Geod. and Cart.Sc.), Bachelor of Science in Medical Technology (B.S. in Med.Tech.), and Bachelor of Science in Oceanography (B.S. in Ocea.)

GRADUATE SCHOOL OF ARTS AND SCIENCES: Master of Arts (M.A.), Master of Fine Arts (M.F.A.), Master of Music (Mus.M), Master of Science (M.S.), Master of Science in Forensic Science (M.S. in Forens.S.), and Doctor of Philosophy (Ph.D.)

SCHOOL OF MEDICINE: Doctor of Medicine (M.D.)

NATIONAL LAW CENTER: Juris Doctor (J.D.), Master of Laws (LL.M.), Master of Comparative Law (M.Comp.L.), Master of Comparative Law (American Practice) (M.Comp.L.(Am.Prac.)), and Doctor of Juridical Science (S.J.D.)

SCHOOL OF ENGINEERING AND APPLIED SCIENCE: Bachelor of Science (Civil Engineering) (B.S. (C.E.)), Bachelor of Science (Electrical Engineering) (B.S. (E.E.)), Bachelor of Science (Measurement Science (B.S. (Meas.S.)), Bachelor of Science (Mechanical Engineering) (B.S. (M.E.)), Master of Science (M.S.), Master of Engineering Administration (M.E.A.), and Doctor of Science (D.Sc.)

SCHOOL OF EDUCATION: Bachelor of Arts in Education (B.A. in Ed.), Bachelor of Science in Physical Education (B.S. in P.E.), Master of Arts in Teaching (M.A.T.), Master of Arts in Education (M.A. in Ed.), Education Specialist (Ed.S.), and Doctor of Education (Ed.D.)

SCHOOL OF GOVERNMENT AND BUSINESS ADMINISTRATION: Bachelor of Business Administration (B.B.A.), Bachelor of Science in General Studies (B.S. in Gen.Std.), Master of Arts in Government (M.A. in Govt.), Master of Arts in Health Care Administration (M.A. in H.C.A.), Master of Business Administration (M.B.A.), Master of Public Administration (M.P.A.), Master of Science in Administration (M.S. in Adm.), Master of Science in Business Administration (M.S. in B.A.), Master of Urban and Regional Planning (M. of Urb. and Reg.Plan.), Graduate Certificate in Health Care Administration (Grad.Cert. in H.C.A.), Doctor of Business Administration (D.B.A.), and Doctor of Public Administration (D.P.A.)

SCHOOL OF PUBLIC AND INTERNATIONAL AFFAIRS: Bachelor of Arts (B.A.), Certificate of the Institute for Sino-Soviet Studies (Cert. of I.S.S.S.), Master of Arts (M.A.), and Master of Science in International Affairs (M.S. in I.A.)

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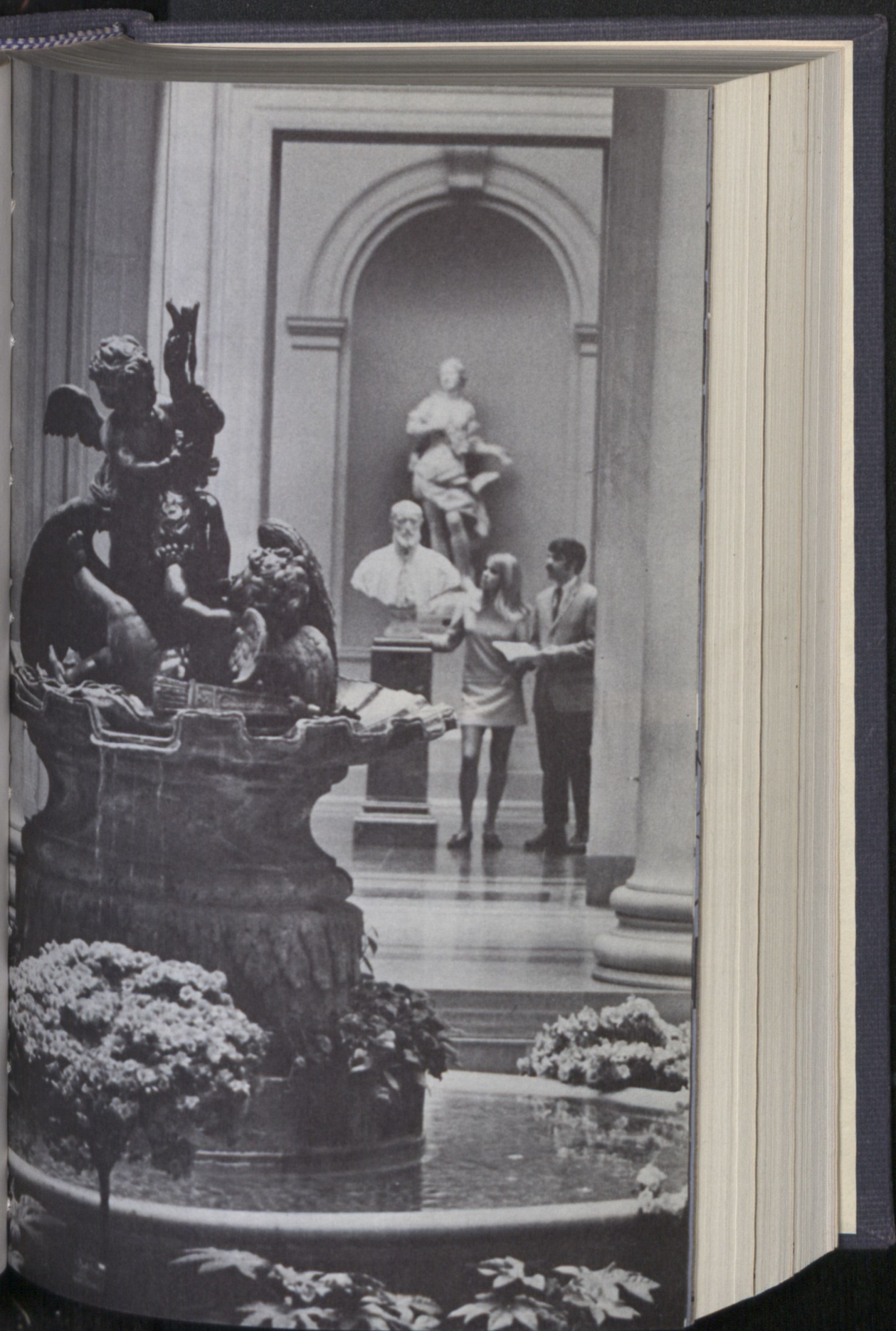
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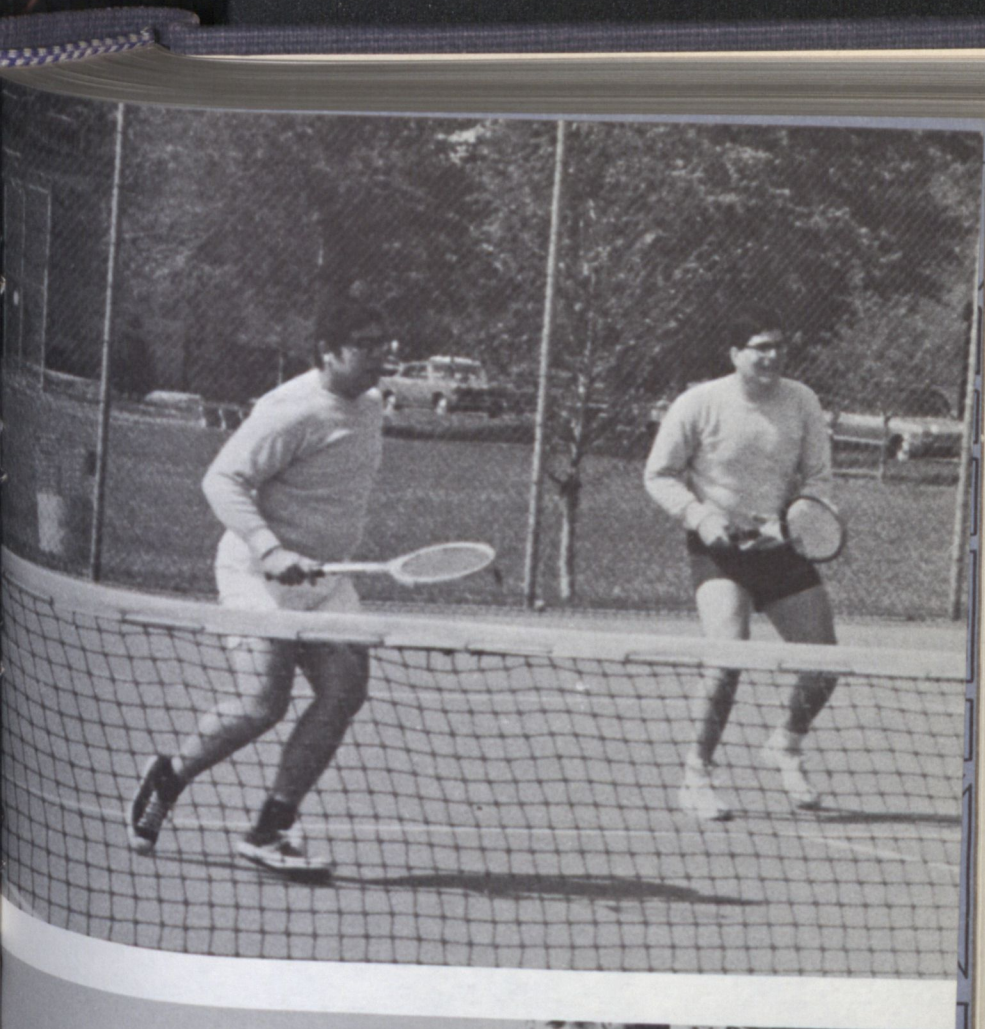
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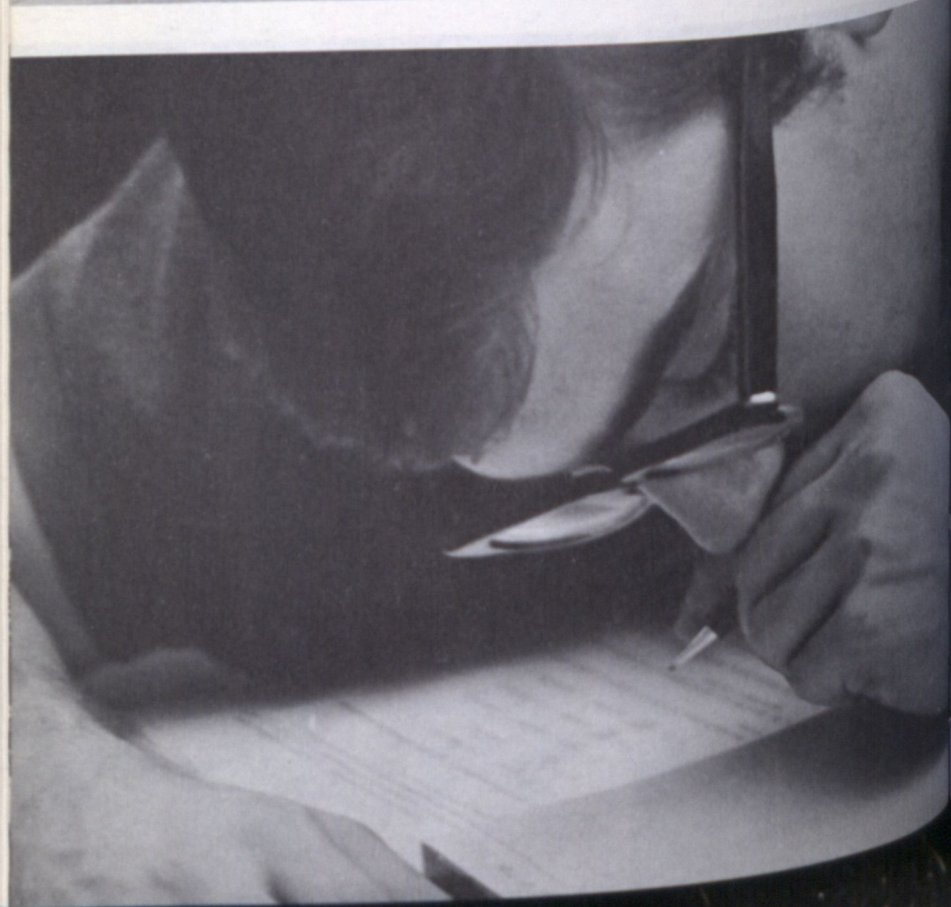
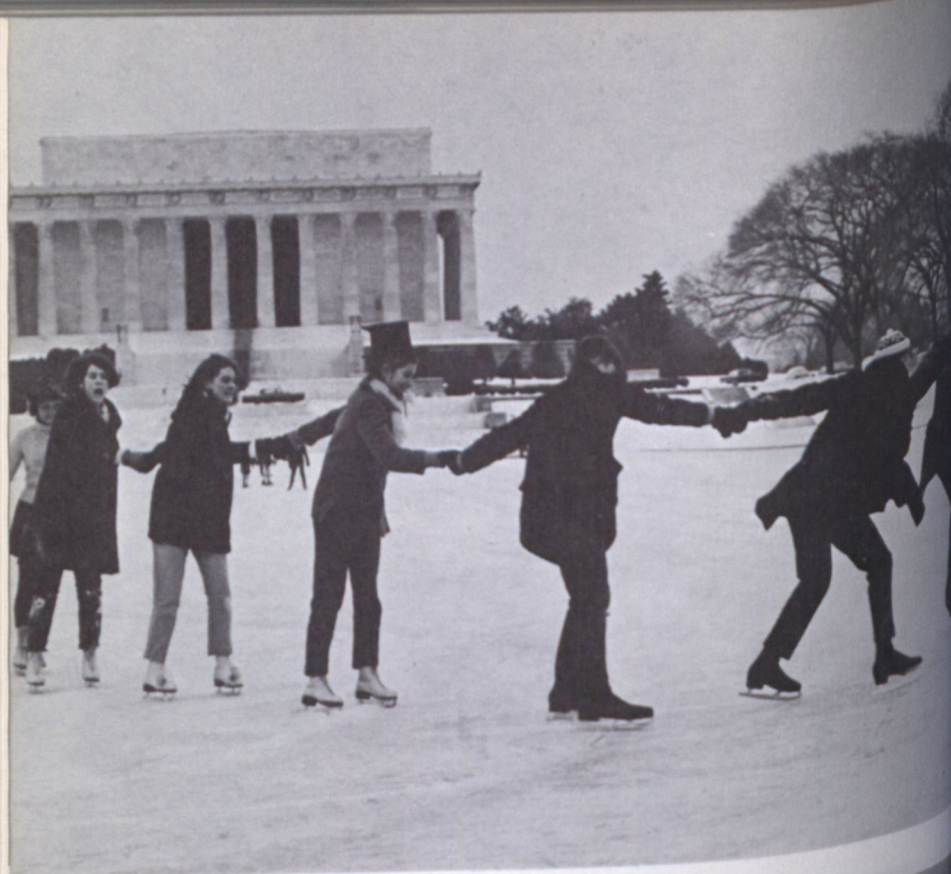
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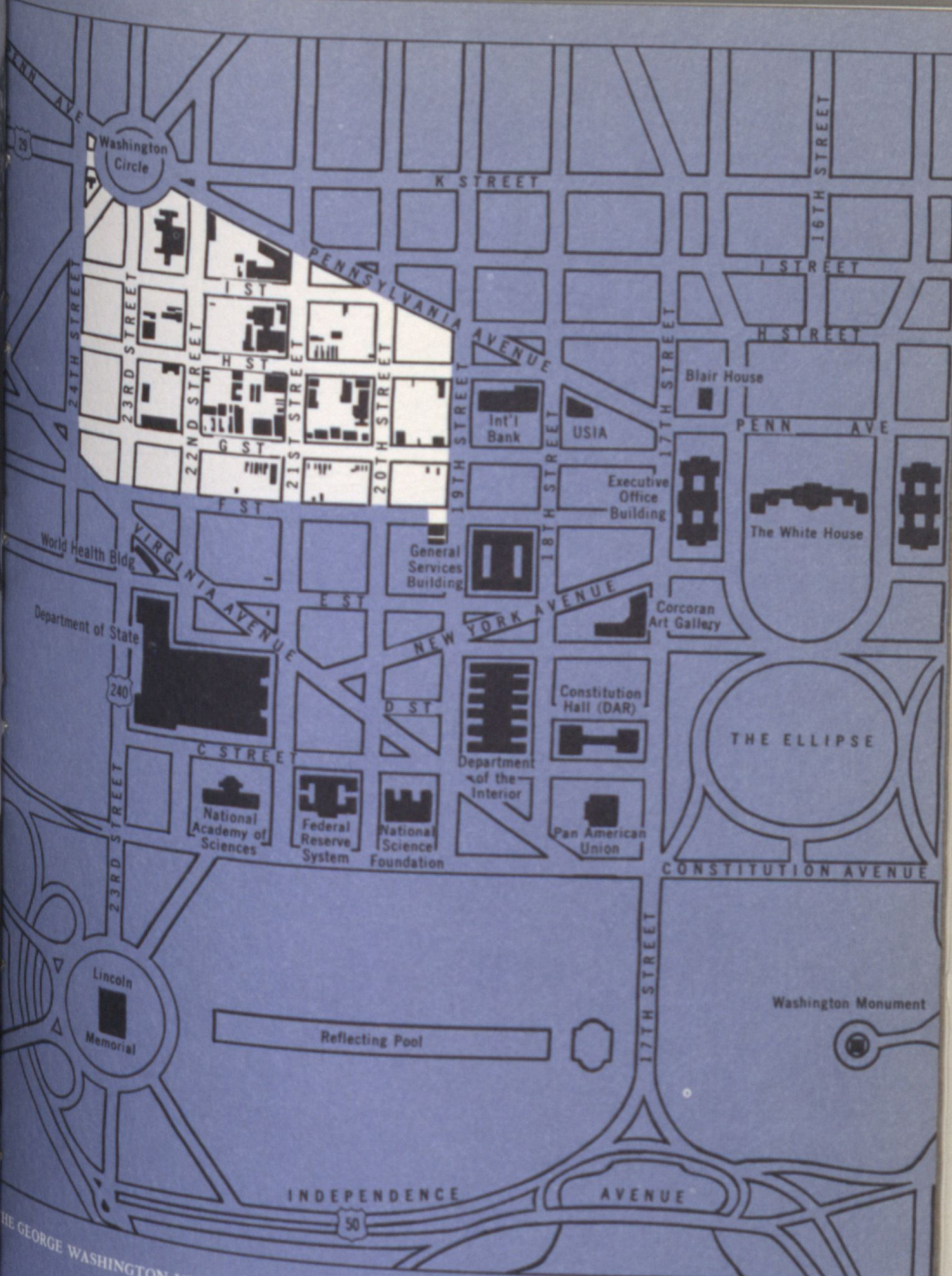
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THE GEORGE WASHINGTON UNIVERSITY

COLUMBIAN COLLEGE OF ARTS AND SCIENCES, 1821

THE GRADUATE SCHOOL OF ARTS AND SCIENCES, 1893

THE SCHOOL OF MEDICINE, 1825

THE NATIONAL LAW CENTER, 1865

THE SCHOOL OF ENGINEERING AND APPLIED SCIENCE, 1884

THE SCHOOL OF EDUCATION, 1907

THE SCHOOL OF GOVERNMENT AND BUSINESS ADMINISTRATION, 1928

THE SCHOOL OF PUBLIC AND INTERNATIONAL AFFAIRS, 1928

THE COLLEGE OF GENERAL STUDIES, 1950

THE DIVISION OF UNIVERSITY STUDENTS, 1930

THE SUMMER SESSIONS, 1916

THE UNIVERSITY HOSPITAL, 1898

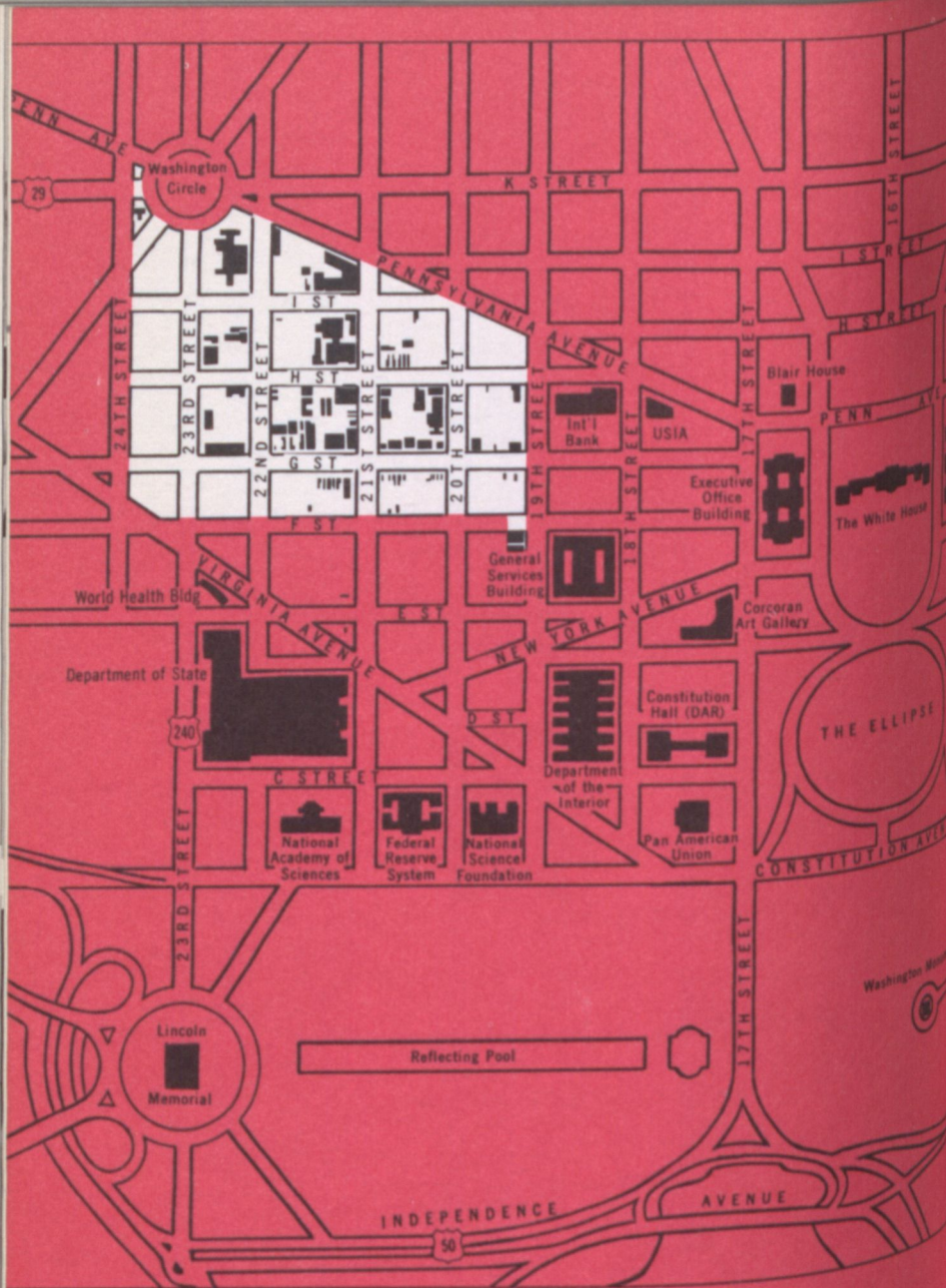
THE UNIVERSITY'S
150TH ANNIVERSARY YEAR
1821-1971

THE GEORGE WASHINGTON UNIVERSITY BULLETIN



COLLEGE
OF
GENERAL STUDIES

1970-1971



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THE COLLEGE OF GENERAL STUDIES 1970-71



Dean Magruder



President Elliott and Dean Magruder

From the Dean's desk . . .

The academic year 1970-71 marks the twentieth anniversary of the College of General Studies. Twenty years of extending the resources of George Washington University into the community have been satisfying and challenging. Because the University is located in one of the principal capitals of the world, CGS possesses unique educational opportunities and recognizes its obligations to the governmental and private sectors that it serves. The challenge has been stimulating, but our accomplishments would not have been possible without dedicated teachers and staff and the harmonious relationships among those we serve.

The problem areas that we shall encounter during the seventies demand a continuous reassessment of our role in view of change and society. As we approach our twenty-first year, the age of maturity, we rededicate ourselves and all the resources at our command to the pursuit of knowledge and its dissemination.

The College of General Studies administers off-campus courses, the off-campus degree programs of three other colleges and schools of the University, conferences, seminars, and institutes. This catalogue has been prepared primarily for the student interested in part-time study in higher education.

Eugene R. Magruder
Dean
College of General Studies

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THE CALENDAR 1970-71

1970	1971	
SEPTEMBER	JANUARY	MAY
S M T W T F S	S M T W T F S	S M T W T F S
6 7 8 9 10 11 12	3 4 5 6 7 8 9	2 3 4 5 6 7 8
13 14 15 16 17 18 19	10 11 12 13 14 15 16	9 10 11 12 13 14 15
20 21 22 23 24 25 26	17 18 19 20 21 22 23	16 17 18 19 20 21 22
27 28 29 30	24 25 26 27 28 29 30	23 24 25 26 27 28 29
	31	30 31
OCTOBER	FEBRUARY	JUNE
S M T W T F S	S M T W T F S	S M T W T F S
4 5 6 7 8 9 10	1 2 3 4 5 6	1 2 3 4 5
11 12 13 14 15 16 17	7 8 9 10 11 12 13	6 7 8 9 10 11 12
18 19 20 21 22 23 24	14 15 16 17 18 19 20	13 14 15 16 17 18 19
25 26 27 28 29 30 31	21 22 23 24 25 26 27	20 21 22 23 24 25 26
	28	27 28 29 30
NOVEMBER	MARCH	JULY
S M T W T F S	S M T W T F S	S M T W T F S
1 2 3 4 5 6 7	1 2 3 4 5 6	1 2 3 4 5
8 9 10 11 12 13 14	7 8 9 10 11 12 13	6 7 8 9 10 11 12
15 16 17 18 19 20 21	14 15 16 17 18 19 20	13 14 15 16 17 18 19
22 23 24 25 26 27 28	21 22 23 24 25 26 27	20 21 22 23 24 25 26
29 30	28 29 30 31	27 28 29 30 31
DECEMBER	APRIL	AUGUST
S M T W T F S	S M T W T F S	S M T W T F S
6 7 8 9 10 11 12	4 5 6 7 8 9 10	1 2 3 4 5 6 7
13 14 15 16 17 18 19	11 12 13 14 15 16 17	8 9 10 11 12 13 14
20 21 22 23 24 25 26	18 19 20 21 22 23 24	15 16 17 18 19 20 21
27 28 29 30 31	25 26 27 28 29 30	22 23 24 25 26 27 28
		29 30 31

1970-71 FALL SEMESTER

August 24-September 18

Off-campus registration† (days of registration and beginning classes will be announced in *Off-campus Schedule of Classes*)

Application for February graduation due as part of registration

September 12

Open House for M.S. in Adm. students, 10 am, Lisner Auditorium *Saturday*

‡September 17-19

Registration on campus† *Thursday-Saturday*
Application for February graduation due as part of registration

September 21

Classes begin off campus and on campus *Monday*

September 26

CGS meeting of Staff of Instruction, 10 am, Lisner Auditorium *Saturday*

* Off-campus courses organized at any time.

† Application for graduation and for Master's Comprehensive Examinations is the student's responsibility and must be made when registering for last courses required for degree.

‡ Hours of registration will be announced in the *Campus Schedule of Classes*.

- September 26 M.S. in Adm. Comprehensive Seminar, 2 pm, Lisner Auditorium *Saturday*
- November 11 Veterans Day (holiday) *Wednesday*
- November 25 Thanksgiving recess begins after last class *Wednesday*
- November 30 Classes resume *Monday*
- December 4-5 M.S. in Adm. Comprehensive Examinations *Friday-Saturday*
- *December 19 Last day of campus fall-semester classes *Saturday*
- December 19 Christmas recess begins after last class *Saturday*
- January 4 Off-campus classes resume *Monday*
- January 4 Master's theses of February candidates due in Dean's Office *Monday*
- January 4-8 Campus fall-semester reading period *Monday-Friday*
- January 9-21 Campus examination period *Saturday-Thursday*
- †January 22 Last day of off-campus fall-semester classes *Friday*

1971 SPRING SEMESTER

- January 4-29 Off-campus registration† (days of registration and beginning classes will be announced in *Off-campus Schedule of Classes*)
Application for June graduation due as part of registration
- January 9 Open House for M.S. in Adm. students, 10 am, Lisner Auditorium *Saturday*
- §January 28-30 Registration on campus‡ *Thursday-Saturday*
Application for June graduation due as part of registration
- January 30 M.S. in Adm. Comprehensive Seminar, 2 pm, Lisner Auditorium *Saturday*
- February 1 Classes begin off campus and on campus *Monday*
- February 6 CGS meeting of Staff of Instruction, 9:30 am, Lisner Auditorium *Saturday*
- February 15 Winter Convocation and Observance of the University's Sesquicentennial (holiday) *Monday*
- April 3 Spring recess begins after last class *Saturday*
- April 13 Classes resume *Tuesday*
- April 16-17 M.S. in Adm. Comprehensive Examinations *Friday-Saturday*
- April 23 School of Engineering and Applied Science Master's theses of June candidates due in Dean's Office *Saturday*

* In certain courses, classes may be continued through the fall-semester reading period, January 4-8.

† The final examination will be given at last class meeting.

‡ Application for graduation and for Master's Comprehensive Examinations is the student's responsibility and must be made when registering for last courses required for degree.

§ Hours of registration will be announced in the *Campus Schedule of Classes*.

<i>May 3</i>	M.S. in Adm. and M.S. in I.A. theses of June candidates due in Dean's Office <i>Monday</i>
<i>*May 8</i>	Last day of campus spring-semester classes <i>Saturday</i>
<i>May 10-14</i>	Campus spring-semester reading period <i>Monday-Friday</i>
<i>May 15-27</i>	Campus examination period <i>Saturday-Thursday</i>
<i>†May 28</i>	Last day of off-campus spring-semester classes <i>Friday</i>
<i>May 31</i>	Memorial Day (holiday) <i>Monday</i>
<i>June 6</i>	Commencement <i>Sunday</i>

1971 SUMMER SESSIONS‡



* In certain courses, classes may be continued through the spring-semester reading period, May 10-14.

† The final examination will be given at last class meeting.

‡ There are two seven and one-half week sessions and one fifteen week session. Days of registration and beginning classes will be announced in the *Off-campus Schedule of Classes*.

THE COLLEGE OF GENERAL STUDIES

THE COLLEGE OF GENERAL STUDIES was established in 1950 as the off-campus college of the University, to extend the educational facilities of the University, introduce experimental programs of study for mature students, and provide educational services other than formal programs of study. The College works closely with education directors; school officials; personnel administrators in government, business, and industry; and others interested in developing in-service training. The College also conducts conferences, seminars, and non-credit courses.

Any organization, group, installation, or agency interested in having the University organize and conduct a course or a comprehensive educational program should contact the Director of Credit Programs, College of General Studies, Telephone 676-7020.

ACADEMIC STATUS

The academic standards of the University are maintained in off-campus credit courses.

The College of General Studies is accredited by its regional accrediting agency, the Middle States Association of Colleges and Secondary Schools.

DEGREE PROGRAMS

Columbian College of Arts and Sciences has academic jurisdiction over the following degrees:

- Bachelor of General Studies
- Bachelor of Science in Environmental Health
- Bachelor of Science in Geodetic and Cartographic Science
- Bachelor of Science in Oceanography

The School of Government and Business Administration has academic jurisdiction over the following degrees:

- Bachelor of Science in General Studies
- Master of Science in Administration

The School of Engineering and Applied Science has academic jurisdiction over the following degrees:

- Master of Engineering Administration
- Master of Science

COUNSELING

Students in the College of General Studies may obtain counseling and assistance in program planning in the offices of the College or from Field Representatives at the installations and agencies at which courses are held. Appointments may be made by calling the College of General Studies: Telephone 676-7028; or through the Education Director at individual installations. University counselors are also available at all installations and agencies during announced registration periods, and at scheduled times each month.

DEAN'S COUNCIL

E.R. Magruder (*Chairman*), S.R. Chitwood, Marvin Gordon, R.L. Holland, H.L. LeBlanc, Hyman Orlin, J.P. Reesing, Jr., Elzberry Waters, Jr., H.F. Bright (ex officio), E.G. Hammer (ex officio), F.R. Houser (ex officio), J.Y. Ruth (ex officio)

COMMITTEE ON SCHOLARSHIP

E.R. Magruder (*Chairman*), G.F. Conner, J.A. Morgan, Jr., Charles Rice, Elzberry Waters, Jr., E.G. Hammer (ex officio), F.R. Houser (ex officio)

Admission**ADMISSION AS A DEGREE STUDENT**

FOR ENTRANCE REQUIREMENTS for Bachelor's degree candidacy, see pages 24-25; for Master's degree candidacy, see pages 35, 42-43, 45.

Application should be made only when the entrance requirements have been met and if there is a reasonable assurance that the student will be in the area long enough to complete degree requirements. Forms for application may be obtained from the College of General Studies, a Field Representative, or the Installation Education Director. An application for admission, together with credentials required and an application fee of \$25,* should be sent (1) to the Office of Admissions of the University for Bachelor's degree study; (2) to the Admissions Officer, School of Government and Business Administration, for study toward the degree of Master of Science in Administration; (3) to the Director of Engineering Admissions, School of Engineering and Applied Science, for study toward the degrees of Master of Engineering Administration and Master of Science.

ADMISSION AS A NONDEGREE STUDENT

There are no preregistration formalities for the following categories of non-degree students: those who wish to enroll in off-campus courses for self-improvement or those who have not yet applied for degree candidacy.

* The application fee must be by check or postal money order, payable to George Washington University.

The application fee is waived for a student applying for readmission who was registered as a degree candidate at the time of his last registration at this University and has not since registered at another institution.

Nondegree students must meet the prerequisites prescribed for specific courses and, if they have previously attended a college or university, be in good standing. The nondegree student enrolling in graduate courses must have a Bachelor's degree, or 90 semester hours of undergraduate work and the permission of the instructors in the courses.

Registration

OFF-CAMPUS REGISTRATION is conducted before or at the first class meeting of each course, at times and places stated in the *Off-campus Schedule of Classes*, available well in advance of each semester.

Registration in an off-campus course constitutes admission to that course only. It does not admit the student to campus courses or to degree candidacy. In the College of General Studies, only students admitted to degree candidacy may enroll as full-time students (for 12 semester hours or more). Those who have been graduated from high school recently and wish to be *full-time freshman* students at this University should apply for admission to the appropriate college or school on campus.

Auditing.—With the permission of the instructor, students may register as "Auditors." An auditor is not required to take active part in the exercises or to take examinations; he receives neither grades nor credit. Tuition is the same for the auditor as for the student registered for credit. With the approval of the Dean, a student may change from credit to audit status during the first third of the semester. A student who takes a course as an auditor may not repeat it later for credit.

Concurrent Registration.—A student registered as a degree candidate in any other college or school of the University may take credit courses in the College of General Studies only by permission (granted prior to registration) of the dean of the college or school concerned. A "College of General Studies Off-campus Concurrent Registration Permit" form must be obtained from the appropriate college or school, signed by the dean of that college or school, and presented at the time of registration in the College of General Studies.

Service personnel enrolled full time for campus courses need the permission of the Dean of the College of General Studies to register concurrently for off-campus courses.

Any student taking course work in another college or school of the University or at another institution through the Consortium of Universities of the Washington Metropolitan Area, Inc., must have the permission of his Dean.

Fees and Financial Regulations

ALL FEES should be paid by check or money order, made payable to George Washington University.

The following fees were adopted for the academic year 1970-71. (See page 11 for projected tuition increases for 1971-74.)

Tuition**On campus:**

Full-time undergraduate program (12 to 18 hours), each semester.....	\$950.00
Part-time undergraduate program or hours in excess of 18, for each semester hour	68.00
Graduate study, for each semester hour.....	68.00

Off campus:*

For each semester hour.....	50.00
Naval Ship Research and Development Laboratory programs, for each semester hour	68.00
War Colleges' and ICAF programs, for each semester hour.....	58.00
Thesis:†	58.00
War Colleges' and ICAF programs, for each semester hour.....	58.00
Master of Science in Administration degree program (other than ICAF), for each semester hour	68.00
Naval Ship Research and Development Laboratory programs, for each semester hour	68.00
NASA-Langley Research Center programs for nonemployees, for each semester hour	50.00

University Center Fee (charged only to students registered on campus, nonrefundable)

For students registered for 11 or more semester hours on campus:	37.50
For each semester.....	
For students registered for less than 11 semester hours in a semester on campus:	3.50
For each semester hour for which the student registers.....	
For on-campus degree candidates maintaining "continuous registration" status:	3.50
For each semester.....	

Special Fees

Application fee (degree candidate), nonrefundable.....	25.00
Graduation fee, due and payable at the time of registration for the last semester or summer session.....	25.00
Continuous Registration fee, <i>off-campus degree candidates</i> , to maintain "continuous registration" during any semester of absence from the University†	50.00
Continuous Registration fee, <i>on-campus degree candidates and degree candidates in the Naval Ship Research and Development Laboratory programs</i> , to maintain "continuous registration" during any semester of absence from the University or after completion of tuition requirements‡	68.00
Continuous Registration fee, <i>War Colleges' or ICAF degree candidates</i> , to maintain "continuous registration" during any semester of absence from the University‡	58.00

* Except War Colleges', ICAF, and Naval Ship Research and Development Laboratory programs.
 † Payment of tuition for a Master's thesis entitles the candidate, during the period of registration, to the advice and direction of the member of the faculty under whom the thesis is to be written.
 In case a thesis is unfinished, additional time may be granted in accordance with the regulations of the school in which the student is registered. (See page 19 for regulations governing military leave.)
 ‡ Payment of the continuous registration fee entitles the student who is granted leave of absence to return and continue his work toward a degree under the academic requirements which were in force at the time of his first registration. The continuous registration fee applies toward neither tuition fee nor residence requirements for the degree. This fee does not apply to students granted military leave (see page 19).

Late-registration fee, for failure to register for campus courses within the designated period.....	\$15.00
Fee for binding two copies of the Master's thesis (other than ICAF programs)	10.00
Fee for binding two copies of the Master's thesis (ICAF programs).....	7.00
Reinstatement fee, for reinstatement after financial suspension for nonpayment of fees.....	15.00
Returned check fee, charged a student whose check is returned because of insufficient funds or improper drafting.....	15.00
Fee for each examination to waive a curriculum requirement.....	5.00
Validating Examination fee.....	100.00
Transcript fee, charged for each transcript of record.....	1.00

PROJECTED TUITION INCREASES 1971-74

Projected increases for the academic years 1971-72, 1972-73, and 1973-74 have been estimated as follows:

On Campus

Increase by year (full-time undergraduate students):	
1971-72	\$150.00
1972-73	150.00
1973-74	150.00

Increase by semester hour (graduate and part-time undergraduate students):	
1971-72	6.00
1972-73	6.00
1973-74	6.00

Off Campus

Increase by semester hour (except War Colleges', ICAF, and Naval Ship Research and Development Laboratory programs):

<i>Course Work Other than Thesis</i>	
1971-72	4.00
1972-73	6.00
1973-74	3.00

<i>Thesis for Master of Science in Administration program</i>	
1971-72	6.00
1972-73	6.00
1973-74	6.00

<i>Thesis for NASA-Langley Research Center programs for nonemployees</i>	
1971-72	4.00
1972-73	6.00
1973-74	3.00

Increase by semester hour (War Colleges' and ICAF programs including thesis):	
1971-72	5.00
1972-73	5.00
1973-74	5.00

Increase by semester hour (Naval Ship Research and Development Laboratory programs including thesis):	
1971-72	6.00
1972-73	8.00
1973-74	6.00

Every effort will be made to keep tuition increases within the above limits. However, it is not possible to project future economic data with certainty, and circumstances may require an adjustment of these estimates.

PAYMENT OF FEES

OFF-CAMPUS COURSES

Fees for each semester are due and payable in full at the time of each registration; however, a student registering for a *fifteen-week credit course* may sign a contract at each registration to make payments in three equal installments—one-third at the time of registration, one-third 30 days after the course begins, and one-third 60 days after the course begins. Payments are due at the stipulated times. Payment envelopes are provided by the College; students will not be billed.

Tuition and fees for credit courses lasting less than fifteen weeks, and for all noncredit courses, are payable in full at registration.

Financial Suspension.—A student who fails to meet a tuition payment when due is automatically suspended and may not attend classes until he has been officially reinstated by the Student Accounts Office and has paid all accrued fees and a \$15 reinstatement fee.

CAMPUS COURSES

All fees are payable at the Office of the Cashier. Tuition and fees for each semester are due and payable in full at the time of each registration.

A student registered for 6 semester hours or more may sign a contract with the Student Accounts Office at the time of each registration permitting him to pay one-half of the total tuition and fees (except for fees payable in advance) at the time of registration and the remaining half on or before November 4, 1970 (for the fall semester) and March 17, 1971 (for the spring semester). A service fee of \$5 will be charged for the use of this deferred payment plan. The University will not obligate itself to notify the student, in advance, of the payment-due date for the second half of the semester charges. Students who fail to make any payment when due will be automatically suspended and may not attend classes until they have paid all accrued fees and a \$15 reinstatement fee and have been officially reinstated by the Student Accounts Office.

A student suspended for failure to meet payments when due may not be reinstated for the semester after two weeks from the date of suspension. Applications for reinstatement are to be made to the Student Accounts Office.

REFUND OF FEES

Applications for withdrawal from the University or for change in class schedule must be made in person or in writing to the dean of the college, school, or division in which the student is registered. Notification to an instructor is not an acceptable notice.

In authorized withdrawals and changes in schedule, cancellations of semester tuition charges and fees will be made in accordance with the following schedule:

1. Complete withdrawal from the University:

FALL SEMESTER

Withdrawal dated on or before September 25, 1970.....	90 per cent
Withdrawal dated September 28 to October 9, 1970.....	75 per cent

Withdrawal dated October 12 to October 23, 1970.....50 per cent
 Withdrawal dated after October 23, 1970.....none

SPRING SEMESTER

Withdrawal dated on or before February 5, 1971.....90 per cent
 Withdrawal dated February 8 to February 19, 1971.....75 per cent
 Withdrawal dated February 22 to March 5, 1971.....50 per cent
 Withdrawal dated after March 5, 1971.....none

2. For a *change in status from full-time to part-time student* or for *partial withdrawal by a part-time student*, the above schedule applies to the difference in charges between the original program and the adjusted program continuing in effect.
3. A student enrolled in a full-time program who drops or adds a course and continues to be in a full-time program will have no financial adjustments of tuition made other than those involving course fees.
4. A student who is granted military leave before completing the semester will receive credits for current charges in accordance with the schedule for complete withdrawal from the University (see No. 1 above). Payments made in excess of the nonrefundable balance will be refunded to the student. The nonrefundable balance will be maintained as a deferred credit for use by the student when he returns to the University (see "Military Leave," page 19).

In no case will tuition be reduced or refunded because of absence from classes. Payment applies only to the semester for which a registration charge is incurred and will not be credited to another semester (exception: students granted military leave, see page 19).

Authorization to withdraw and certification for work done will not be given a student who has not a clear financial record.

Regulations**CAMPUS STUDY**

OFF-CAMPUS DEGREE CANDIDATES may register for campus courses approved for their programs if these courses are not conveniently available at off-campus centers. Students must notify the Office of Student Records, College of General Studies, telephone 676-7017, at least two weeks prior to the date of campus registration so that a registration packet may be prepared. Packets may be picked up by the student at the University Library prior to and during registration.

A student may register for on-campus courses as a nondegree student in the Division of University Students.

ACADEMIC WORK LOAD

Only students admitted to degree candidacy may enroll as full-time students, i.e., for 12 or more hours in a semester. Students taking course work to qualify for degree candidacy, registered in this College, may take not more than 10 hours in a semester.

A full-time undergraduate student who is not on probation may take ordinarily not more than 17 semester hours. A student employed more than 20 hours a week, who is not on probation, may take not more than 10 hours.

A full-time undergraduate student who is a candidate for a degree in the School of Government and Business Administration and whose quality-point index is 3.50 or higher may take not more than 18 hours. An employed undergraduate student who meets the same standard may take not more than 12 hours.

A full-time undergraduate student who is a candidate for a degree in Columbian College of Arts and Sciences and who during the immediately preceding semester has received no grades below High Pass and has earned Honors grades in three courses totaling at least 9 semester hours may take 18 or 19 hours. An employed undergraduate student who during the immediately preceding semester has no grades below High Pass and has earned grades in two courses totaling at least 6 semester hours may take not more than 12 hours.

A student on probation normally may take not more than 3 semester hours.

A student who accepts employment after registration or at any time during a semester must report that fact immediately to the Dean so that his program may be adjusted, if necessary.

A full-time graduate student who is a candidate for a degree in the School of Government and Business Administration may take not more than 12 semester hours. A graduate student who is employed more than 20 hours a week may take not more than 6 hours.

ATTENDANCE

In a fifteen-week course in which classes meet once a week, *one* unexcused absence is permitted. In a fifteen-week course in which classes meet twice a week, *two* unexcused absences are permitted. In an eight-week course meeting twice a week, *one* unexcused absence is permitted. Minimum absences per semester will not be used as the sole reason for failing a course. It is the University policy that students attend courses regularly.

Excuses must be made by written application to the instructor, or by verbal permission later confirmed in writing. The student is held responsible for all course work.

EXAMINATION FOR WAIVING CURRICULUM REQUIREMENTS

During the first full semester of degree candidacy, a student wishing to omit a required course may, with the permission of the faculty adviser, take a waiver examination, the passing of which relieves him of the curriculum requirement and qualifies him for registration in an advanced course. *Passing of the waiver examination does not entitle the student to credit toward a degree.* The fee for each 3-hour course examination is \$5.

SCHOLARSHIP

GRADES

Grades are mailed to the student through the Office of the Registrar at the close of each semester. They are not given out by instructors or the administrative staff.

UNDERGRADUATE

Columbian College of Arts and Sciences.—The following grading system is used: *H*, honors; *HP*, high pass; *P*, pass; *F*, fail; *I*, incomplete; *W*, authorized withdrawal. A student may not repeat for credit a course in which he has received a grade of Pass or better, unless required to do so by the department concerned. A written statement to this effect must be submitted to the Registrar by the appropriate departmental chairman.

School of Government and Business Administration.—The following grading system is used: *A*, excellent; *B*, good; *C*, average; *D*, pass; *F*, fail; *I*, incomplete; *W*, authorized withdrawal. A student may not repeat for credit a course in which he has received a grade *D* or above.

GRADUATE

The following grading system is used: *A*, excellent; *B*, good; *C*, minimum pass; *F*, fail; *I*, incomplete; *CR*, credit; *W*, authorized withdrawal. A student taking School of Government and Business Administration courses may not repeat for credit a course in which he has received a grade of *C* or above. A student taking School of Engineering and Applied Science courses may not repeat for credit a course in which he has received a grade of *C* or above, unless required to do so by the department concerned; a written statement requiring the student to repeat such a course for credit must be submitted to the Registrar by the appropriate department chairman.

INCOMPLETE/AUTHORIZED WITHDRAWAL

Whenever a grade has not been assigned, the symbol *I* (incomplete) or the symbol *W* (authorized withdrawal) will be recorded. The symbol *I* indicates that a satisfactory explanation has been given the instructor for the student's failure to complete the required work of the course. An "incomplete" cannot be made up after the lapse of one calendar year except by written permission of the appropriate dean. An incomplete which is not removed within one calendar year is automatically changed to an *F*. An incomplete cannot be removed by repeating the course.

QUALITY-POINT INDEX*

Quality points are computed from grades as follows:

For each semester hour of the letter grade—*A*, 4 points; *B*, 3 points; *C*, 2 points; *D*, 1 point; *F*, no points.

Scholarship is computed in terms of the quality-point index. This is done by dividing the total number of quality points by the total number of semester hours for which the student has registered. Example: if a student received an *A* in one three-credit course, and a *B* in another three-credit course, he would compute his quality-point index this way:

$$\begin{array}{r} A = 4 \times 3 \text{ (semester hours)} = 12 \\ B = 3 \times 3 \text{ (semester hours)} = 9 \\ \hline 6 \end{array}$$

$$21 \div 6 = 3.5 \text{ quality-point index}$$

* Applicable only to students taking School of Government and Business Administration courses.

Courses marked *W*, *I*, or *CR* are not considered in determining the index, except that courses marked *I* will be considered when a formal grade is recorded. An incomplete which is not removed within one calendar year is automatically changed to an *F*. Grades in courses taken at other institutions are not considered in computing the quality-point index.

WARNINGS

At stated intervals during the academic year students who are doing work of *D* grade or lower (School of Government and Business Administration) or students who are doing unsatisfactory work (Columbian College of Arts and Sciences) in courses with departmental numbers below 100 receive "warnings." A "warning" constitutes notice to the student that he must consult his instructor and his adviser at the earliest opportunity. "Warning periods" are established during the seventh and eighth weeks of fifteen-week courses, and during the third and fourth weeks of eight-week courses.

PROBATION

Undergraduate Probation in the School of Government and Business Administration.—A student must maintain a quality-point index of at least 2.00 or be placed on probation.

A student who has attempted 12 or more semester hours of work and whose cumulative quality-point index is between 1.50 and 2.00 is placed on probation for the period in which he attempts 12 additional semester hours of work. If his quality-point index is still below 2.00 at the end of his probationary period, he is suspended. The Committee on Scholarship reserves the right to extend the period of probation even if the student has earned an average of above 2.00. A student placed on probation for a third period, whether successive or after an interval, is suspended.

Undergraduate Probation in Columbian College of Arts and Sciences.—A student who is not suspended or on probation is considered to be in good standing. A student* who in one semester receives two grades of Fail in courses carrying 3 or more semester hours of credit each, or the equivalent, is placed on probation. A student on probation who receives one grade of Fail in such a course will be continued on probation for a second semester. A student on probation taking 12 or more semester hours whose grades are all Pass or better is removed from probation.

Graduate Probation in the School of Government and Business Administration.—A student who has attempted 6 or more semester hours and whose quality-point index is between 2.50 and 3.00 is placed on probation for the period in which he attempts 12 additional semester hours of work. If his quality-point index is still below 3.00 at the end of his probationary period, he is suspended. If, after probation is removed, a student's quality-point index again falls below 3.00, he is suspended.

* The rules governing probation and suspension are applicable as stated to students enrolled for a full-time program (12 semester hours or more) during the fall or spring semester. Students enrolled for less than 12 semester hours during the fall or spring semester and students enrolled during the summer sessions are subject to probation or suspension on the basis of their record for 12 semester hours, or multiples thereof, rather than on their record in any one semester.

SUSPENSION*

Undergraduate Suspension in the School of Government and Business Administration.—A student who has attempted 12 or more semester hours of work and whose cumulative quality-point index is below 1.50 is subject to suspension; however, a student who has a quality-point index between 1.40 and 1.50 is considered by the Committee on Scholarship, which may retain him on probation or suspend him. A student who has attempted 6 or more semester hours of work and has a quality-point index of 1.00 or below is suspended.

Undergraduate Suspension in Columbian College of Arts and Sciences.—A student† who in one semester receives grades of Fail in three courses carrying 3 or more semester hours of credit each, or the equivalent, is suspended. A student on probation who receives two or more grades of Fail in such courses is suspended. A student who receives one or more grades of Fail in such courses in a second semester of probation is suspended.

An undergraduate student who is subject to probation for the third time, whether successive or after an interval, is suspended.

An undergraduate student suspended for poor scholarship cannot register for courses even as an auditor. He may apply for readmission after the lapse of either the fall or the spring semester. He must then submit evidence to the Committee on Scholarship that he is better qualified to pursue college work. A student suspended twice for poor scholarship will not be readmitted.

Graduate Suspension in the School of Government and Business Administration.—A student who has attempted 6 or more semester hours of work and whose cumulative quality-point index is below 2.50 is suspended.

READMISSION‡

A student who withdraws, is suspended, or is otherwise absent from the University for one semester or more, may re-enter and continue his work only under the rules and regulations in force at the time of his return. Complete and official transcripts from each institution the student has attended since making his previous application must be sent to the appropriate office at this University before his application for readmission can be evaluated.

CHANGES IN PROGRAM OF STUDIES

DROPPING A COURSE OFF CAMPUS

A course may be dropped without academic penalty during the first third of the semester. Withdrawing from a course without academic penalty after the first third of the semester requires approval of a written request, which should be addressed to the Dean of the College of General Studies.

* For Financial Suspension see "Payment of Fees," page 12.
 † The rules governing probation and suspension are applicable as stated to students enrolled for a full-time program (12 semester hours or more) during the fall or spring semester. Students enrolled for less than 12 semester hours during the fall or spring semester and students enrolled during the summer sessions are subject to probation or suspension on the basis of their record for 12 semester hours, or multiples thereof, rather than on their record for any one semester.
 ‡ When there are curriculum changes in graduate programs in the School of Government and Business Administration, the readmitted student may be required to take additional course work in preparation for the Master's Comprehensive Examinations.

Procedure for Dropping Courses.—An off-campus drop slip (obtainable from the instructor, Field Representative, or the College of General Studies) must be completed, signed and dated by the instructor, and submitted to the College of General Studies.

Failure to follow the proper procedure will result in an automatic grade of *F* and, regardless of the time of discontinuance, will not relieve the student of financial responsibility for the entire course.

DROPPING A CAMPUS COURSE

A *campus* drop slip (available at the Office of the Registrar) must be completed, signed and dated by the instructor, and submitted to the Office of Student Records, College of General Studies.

Withdrawal between the last working day* in October and the end of the fall semester and between the last working day* in February and the end of the spring semester is permitted only in exceptional cases.

All charges for courses dropped without the approval of the dean must be met by the student. Reporting the dropping of a course to an instructor does not constitute an official withdrawal.

TRANSFER WITHIN THE UNIVERSITY

Transfer of residence to the College of General Studies, as a degree candidate, from another college, school, or division of the University may be made only with the approval of the deans concerned. Applications for transfer are available at the University's Office of Admissions or at the office of the appropriate dean. Upon transfer the student should consult his faculty adviser as to the requirements he must fulfill.

A maximum of 90 semester hours is transferrable toward a Bachelor's degree, 18 toward a Master of Science in Administration degree. Students transferring within the University are advised to note the residence requirements of the degree sought.

CREDIT

Credit toward a degree is given only after registration for and satisfactory completion of the required work of courses in the University, or upon the granting of advanced standing in accordance with the regulations of the College.

For transfer from credit to audit status, see page 9.

BALANCE SHEET

On request, the Registrar will issue to undergraduate degree candidates a balance sheet showing the amount of work completed and the requirements remaining to be met for the degree. A second balance sheet will be issued only in the event the student changes major or degree objectives.

TRANSCRIPTS OF RECORD

Official transcripts of student records will be issued on request of the student or former student. A fee of one dollar is charged for each transcript. No cer-

* The University work week is Monday through Friday, inclusive.

tificate of work done will be issued for a person who does not have a clear financial record.

CONTINUOUS REGISTRATION

Degree candidates are expected to maintain continuous registration until all degree requirements are satisfied. Students who have completed course registration (including the thesis) must maintain continuous registration by paying the "continuous registration" fee (see page 10). By failing to register for one semester or more, the student breaks his registration and must be readmitted (see "Readmission," page 17). A "Readmitted Student" is required to satisfy the curriculum requirements existing at the time of his readmission. The maintaining of continuous registration normally is limited to a period of one year.

Students must be registered during the summer if they are taking courses, are taking required examinations, are receiving guidance toward theses, or are expecting to graduate at the end of the Summer Sessions.

MILITARY LEAVE

A student called to active duty may be granted military leave for the period of active duty, upon presentation to his dean of a copy of his orders and a petition for such leave. The maintenance of "continuous registration" is not required of the student on military leave; however, he must apply for readmission to the University well in advance of the semester in which he expects to return. Payments for tuition and fees which are not refunded to the student at the time he is granted military leave will be maintained as a deferred credit for his account and use upon return to the University.

GRADUATION REQUIREMENTS

To be recommended for graduation a student must have met the admission requirements of his college or school; completed satisfactorily the scholarship, curriculum, residence, and other requirements for the degree for which he is registered; and be free from all indebtedness to the University. Registration, either for course work or on the "continuous registration" fee basis, is required for the semester or summer session immediately preceding the awarding of the degree. For the Military Cooperative programs, which are on a different academic year schedule, registration in the last semester of the academic year of the program fulfills this requirement.

Application for Graduation.—An "Application for Graduation" form must be filed and the appropriate fee paid at the time of registration for the last semester or summer session of the senior or final year. Students completing degree requirements during the Summer Sessions will be awarded diplomas (no formal convocation) September 30, *provided* they have completed all degree requirements and have applied for graduation as a part of registration for the Summer Sessions.

Scholarship.—The student must meet the scholarship requirements for the particular degree for which he is registered.

Curriculum.—See the requirements for the degree concerned.

Residence.—A student is "in residence" only when registered for course work after making application for admission to degree candidacy or for the 15 se-

mester hours undertaken to qualify for degree candidacy (see the specific residence requirements for the degree concerned).

With the permission of the appropriate dean, a student may be granted leave of absence; such student should, however, remain technically in residence by paying the continuous registration fee for each semester he is absent. For the purpose of this regulation, the summer session is disregarded.

Except for Master's degree candidates in the School of Engineering and Applied Science, service personnel who receive military transfers when they are within 6 hours of a degree may, by special arrangements, be permitted to complete their work elsewhere, transfer these credits to the College of General Studies, and receive a degree from this University. This procedure does not apply to Master's candidates who have been granted 6 hours of transferred credit or have not completed the required courses.

Attendance and Conduct.—The University reserves the right to refuse to confer a degree upon a candidate whose attendance or conduct has been unsatisfactory.

Thesis.*—A thesis, submitted in partial satisfaction of requirements for the Master's degree, must be submitted in its final form to the appropriate dean no later than the date specified in the calendar. Two complete copies of each thesis are required. It is the responsibility of the candidate for a graduate degree to obtain from the College of General Studies a printed copy of the regulations governing the styling and reproduction of the thesis. These regulations are rigidly enforced (see page 36).

Accepted theses, with accompanying drawings, become the property of the University and are deposited in the University Library, where the duplicate copies are bound and made available for circulation. Permission to publish or adapt material in them must be secured from the dean.

HONORS

Dean's List.—To be eligible for inclusion on the Dean's List, a student must be a candidate for an undergraduate degree. Course work taken while the application for admission is being processed will be computed in determining eligibility for the Dean's List. A full-time degree candidate in the School of Government and Business Administration programs must have a minimum quality-point index of 3.50 for the semester concerned; a part-time degree candidate must have a quality-point index of 3.50 on the last 12 semester hours of work and must have maintained continuous registration for at least one three-hour course during the period concerned. Eligibility for inclusion again will be determined on the basis of the subsequent 12 semester hours of work. In Columbian College of Arts and Sciences degree programs, a student must have received grades of Honors in at least 60 per cent of the last 15 semester hours of work and no Fail grades.

With Distinction.—The undergraduate degrees may be conferred "With Distinction," at the discretion of the Dean's Council of the College and the Committee on Scholarship if a student meets the following qualifications: in the School of Government and Business Administration programs he must attain a quality-point index of 3.50 or higher on all work taken at this University, or

* Applicable only to programs in the School of Government and Business Administration. See pages 43-44 for *Thesis* in the School of Engineering and Applied Science.

in Columbian College of Arts and Sciences programs he must have received grades of Honors in at least 60 per cent of the courses taken at this University.

To be eligible for this honor a student must have completed at this University at least one-half of the course work required for the degree.

Special Honors.—Special Honors may be awarded to any member of the graduating class for outstanding achievement in the student's concentration of work on recommendation of the major department, under the following regulations:

1. The student must have his candidacy for Special Honors approved by the faculty member representing the major department or concentration no later than the beginning of the senior year.

2. The student must meet such other conditions as may be set at the time his candidacy is approved.

3. No student will be awarded Special Honors unless he meets the following qualification: in the School of Government and Business Administration programs he must have achieved a quality-point index of at least 3.00 on all work taken at this University, or in Columbian College of Arts and Sciences programs he must have earned High Pass or Honors grades in 50 per cent of the courses taken at this University.

4. To be eligible for honors a student must have completed at this institution at least one-half of the academic course work required for the degree.

DISHONESTY

If a student knowingly makes a false statement or conceals material information on an application for admission, registration card, or any other University document, his registration may be cancelled. If such falsification is discovered after the student has established an academic record at the University, he may be subject to dismissal from the University. Such a student will be ineligible (except by special action of the Dean's Council) for subsequent registration in any unit of the University.

Academic dishonesty on the part of any student will result in a disciplinary grade of *F* for the course involved and also may, upon the recommendation of the Dean's Council, result in his suspension from the University for a stated period, at the end of which time he may petition for readmission. The disciplinary grade of "Failure—Academic Dishonesty" will be recorded for the course involved, and this grade will be employed in the computation of the quality-point index or academic standing. A student so suspended shall be withdrawn from all other courses except those in which all work has been completed.

THE LIBRARY

A student registered in the College of General Studies is entitled to the reference use of the University Library. Its stacks are open, and all students are welcome to browse at their leisure. A library card is issued to each student.

The loan period for most books available for outside circulation is 30 days. A fine of 25 cents is charged for each day a book is overdue. Any book which circulates is subject to recall by the Library at any time if needed for reserve or other use. Reserve books must be used in the reserve reading room when the Library is open, except that they may be withdrawn for overnight use beginning at 8:30 p.m. A fine of 50 cents is charged for each hour or fraction

thereof that a reserve book is overdue. Grades of a student are withheld until his library record is clear.

The hours of the University Library are: Monday through Friday, 8:30 a.m. to 12 midnight; Saturday, 9 a.m. to 10 p.m.; Sunday, 1 p.m. to 12 midnight.

RIGHT TO DISMISS STUDENTS

The right is reserved by the University to dismiss or exclude any student from the University, or from any class or classes, whenever, in the interest of the student or the University, the University Administration deems it advisable to do so.

RIGHT TO CHANGE RULES

The University and its various colleges, schools, and divisions reserve the right to modify or change requirements, rules, and fees. Such regulations shall go into force whenever the proper authorities may determine.

RECENTLY ESTABLISHED REGULATIONS

An Appendix (pages 120-21) contains regulations recently approved by the University's Board of Trustees.

UNIVERSITY POLICY ON RELEASE OF STUDENT INFORMATION

In general, the policy of the University is one of attempting to keep the student's record confidential and out of the hands of those who would use it for other than legitimate reasons. At the same time, the policy must be flexible enough not to hinder the student, the University, or the community in their legitimate endeavors.

No information concerning a student will be released except as noted below:

1. Information such as whether or not the student is currently enrolled; dates of attendance; verification of date and place of birth; degrees earned, if any, date, major field or area of concentration, and honors received; home and local addresses and telephone numbers; school, college, or division of enrollment, and class; verification of signature; name and address of parent or guardian.

2. The issuance of formal transcripts of record to recognized institutions of higher learning; the certification of academic achievement to the various recognized professional associations (law, medicine, engineering, education, etc.).

Additional information will be released only on written authorization from the student, or by court order or subpoena. If a subpoena is served, the student whose record is being subpoenaed will be notified and the subpoena will be referred to the University's legal counsel.

Government investigative agencies have no inherent right to access to student files and records. If expressly requested, properly identified representatives from federal, state, or local government agencies may be given the information listed under No. 1 above.

UNIVERSITY POLICY ON SELECTIVE SERVICE INFORMATION

The University notifies draft boards of a student's academic status only when the student requests or authorizes, in writing, that the draft board be notified.

A Selective Service Information Card is put into the registration packet of each male student who has not reached his 26th birthday, registered on campus, exclusive of those in the National Law Center and the School of Medicine. This card contains the following statement:

By my signature below, I hereby authorize the University to notify my draft board of my academic status in the University, or of any changes in academic status that occur during this semester.

If the student signs the card, the University then automatically notifies the draft board. If the student does not sign the card, no notification is sent. National Law Center students and students in the School of Medicine should check with the appropriate dean's office for details of the policy in their school.

Student Services

HONOR SOCIETY

Alpha Sigma Lambda.—A national honor society for part-time evening college and off-campus undergraduate degree students, the purpose of which is to recognize and to encourage scholarship and leadership among undergraduate degree candidates. Membership is limited to students who have been enrolled for four semesters or terms in the College of General Studies and have completed 30 semester hours of work toward a degree with a 3.50 average, or equivalent. The Alpha Alpha Chapter was established at George Washington University in 1965.

VETERANS EDUCATION

The Office of the Registrar, Luther Rice Hall, 2121 Eye Street, N.W., assists students entitled to educational benefits as veterans or war orphans with any problems which may arise concerning their benefits. This Office also processes certifications of enrollment and attendance to the Veterans Administration so that monthly allowances will be paid.

When feasible, students entitled to benefits as veterans or war orphans should consult the Office of the Registrar prior to submitting application to the Veterans Administration. All such students should obtain the instruction sheet issued by the Office of the Registrar, which sets forth requirements to be fulfilled before certification of enrollment can be made to the Veterans Administration, and which includes other information of general interest.

The Veterans Administration is at 2033 M Street, N.W., Washington, D.C. 20421.

STUDENT AND ALUMNI CAREER SERVICES OFFICE

The Student and Alumni Career Services Office, Woodhull House, 2033 G Street, N.W., provides assistance to degree-seeking students and alumni seeking full-time, part-time, temporary, or permanent employment. The Office maintains a registry of positions available in many fields, both locally and nationally, and refers qualified applicants for consideration. The Office administers the on-campus Industrial and Government Recruitment Interview Program for

seniors and graduate students, in which private companies, government agencies, service organizations, public school systems, and universities participate. The Office also handles the referral and placement functions of the on-campus College Work Study Program. Prospective teachers may establish permanent credentials files in the Student and Alumni Career Services Office. This service includes files for alumni seeking college and university faculty and administrative positions. The Office also provides individual interviews for students and alumni wishing career guidance.

The Office is open from 9 a.m. to 5 p.m., Monday through Friday.

The Bachelor's Degrees

THE FACULTY of Columbian College of Arts and Sciences has academic jurisdiction over the degrees of Bachelor of General Studies with areas of concentration in history, mathematics, political science, and psychology; Bachelor of Science in Environmental Health; Bachelor of Science in Geodetic and Cartographic Science; and Bachelor of Science in Oceanography. The Faculty of the School of Government and Business Administration has academic jurisdiction over the degree of Bachelor of Science in General Studies with areas of concentration in accounting and business administration. These off-campus programs are administered by the College of General Studies.

REQUIREMENTS FOR DEGREE CANDIDACY

Secondary school graduates applying for Bachelor's candidacy must present the combined evidence of (1) an acceptable certificate of graduation from an accredited secondary school, showing a minimum of fifteen "units"* in a college preparatory or academic curriculum; (2) the principal's statement that the applicant is adequately prepared to undertake college work with reasonable prospect of success; (3) College Entrance Examination Board scores on the Scholastic Aptitude Test and the English Composition Achievement Test (for students out of high school several years, other appropriate tests may be prescribed).

Mature students who do not meet these requirements may be considered for degree candidacy after the satisfactory completion of at least 15 semester hours of course work with a quality-point index of 2.50 or higher, or grades of High Pass or better in 60 per cent of course work. This course work must include Engl 1 or 1x and 2, *English Composition*, and 9 semester hours of course work in at least two of the following areas: Humanities (literature, philosophy, foreign languages), Social Science (anthropology, economics, geography, history, political science, sociology), and Natural Science and Mathematical Sciences.

The selection of qualifying courses should be made in conference with the faculty adviser, and a conference concerning plans for study is required of each applicant for admission to candidacy.

* A unit represents a year's study in a secondary school subject, including in the aggregate no less than 120 sixty-minute periods, or the equivalent, of prepared classroom work.

ADVANCED STANDING

THROUGH TRANSFER FROM OTHER COLLEGES AND UNIVERSITIES

Properly certified courses taken at accredited colleges or universities may be applied toward a degree, subject to the curriculum requirements of the degree program for which admission is sought. Although a grade of *D* is not acceptable for transfer, it may be used to satisfy a curriculum requirement. It may not, however, be counted toward the total number of semester hours required for the degree, and it should not be repeated.

Transfer students whose previous academic records raise doubts of their ability to complete degree requirements successfully must complete 15 hours of course work in this College with a quality-point index of 2.50 or higher, or grades of High Pass or better in 60 per cent of course work, to be considered for degree candidacy. Courses taken to qualify for candidacy must be distributed over two or more of the following areas: Humanities (literature, philosophy, foreign language), Social Science (anthropology, economics, geography, history, political science, sociology), and Natural Science and Mathematics. (Students who have not successfully completed an acceptable college course in English Composition must include Engl 1 or 1x and 2.) Applicants who have been suspended for academic reasons from this University or another institution must fulfill this same 15-hour requirement and also obtain written approval of a petition for admission to degree candidacy from the appropriate Committee on Admission and Advanced Standing.

The University reserves the right to refuse credit for transfer in whole or in part, or to allow it provisionally. Credit so given may be withdrawn for subsequent poor work.

It is the responsibility of the student to have an official transcript sent directly from each institution formerly attended to the Office of Admissions, George Washington University, Washington, D.C. 20006.

If the transcript from a higher institution includes the record of his secondary school work, it is not necessary for the applicant to have forwarded a separate record from the principal of the secondary school.

THROUGH SERVICE SCHOOLS, VALIDATING EXAMINATIONS, AND
CORRESPONDENCE COURSES

In addition to credit allowed in transfer from other accredited colleges or universities, a maximum of 30 semester hours of advanced standing in this College may be obtained by any combination of the following methods.

Service Schools.—Except for those students enrolled as candidates for the Bachelor of Science in Geodetic and Cartographic Science or the Bachelor of Science in Oceanography degree, a maximum of 30 semester hours may be obtained on the basis of service schools satisfactorily completed, as evaluated in accordance with the "Guide to the Evaluation of Educational Experience in the Armed Forces." Ordinarily such subjects are counted as electives. No credit will be allowed for military experience as such.

Validating Examinations.—A maximum of 12 semester hours may be obtained by validating examinations. With the approval of the departmental adviser concerned, permission to take such examinations is granted those who are qualified by work experience and background. Validating examinations may be taken only once, and a grade of *C* or better is required for credit. The fee for each 3-hour course examination is \$100.

Correspondence Courses.—Except for those students enrolled as candidates for the Bachelor of Science in Geodetic and Cartographic Science or the Bachelor of Science in Oceanography degree, a maximum of 15 semester hours may be earned through the successful completion of correspondence courses of college level which are offered by the U.S. Armed Forces Institute or a regionally accredited college or university.

REQUIREMENTS FOR THE DEGREES

RESIDENCE

The last 30 semester hours, including at least 12 hours in the area of concentration, must be completed in residence as a candidate for the degree sought, unless special permission is granted by the appropriate dean to take work elsewhere. This requirement applies to students transferring within the University as well as to students transferring from other institutions. Summer work and the 15 hours taken in order to be considered for degree candidacy may be counted in residence, but in no case may the period of residence aggregate less than 30 weeks. For regulations governing military students who are transferred when they are within 6 semester hours of their degrees, see page 20.

Transfers.—Transfer students from other colleges or universities must complete satisfactorily at least 12 semester hours of the required work in their area of concentration in residence as a candidate for the degree sought.

BACHELOR OF GENERAL STUDIES

Faculty Adviser: Edson G. Hammer, College of General Studies, F-15A; Telephone: 676-7016.

The Bachelor of General Studies curriculum aims to provide the adult part-time student with the opportunity to obtain a broad education. For that reason the course work required in the first and second years is distributed among Communications (written and oral), the Humanities, Natural Science and Mathematical Sciences, and the Social Sciences. In choosing the third- and fourth-year course work required in departments related to their concentration, students should obtain counseling through the faculty adviser.

Students planning to work toward Master's degrees are advised to plan their Bachelor's programs so that they will meet the prerequisite requirements of the school or college of their choice. Students planning to enter graduate programs which require a reading knowledge of a foreign language are advised to include two years of one foreign language in their Bachelor's program.

Scholarship.—To remain in good standing and to qualify for graduation, a student must maintain grades of High Pass or Honors in half the courses taken in the selected area of concentration.

The system of grading is described on pages 14–15. For regulations concerning probation, suspension, and readmission, see pages 16–17.

FIRST AND SECOND YEARS

Communications

Engl 1 or 1x, 2.....
Engl 11; Sp&D 111 or 121.....

Semester
Hours
6
6

Humanities*

Hum 1-2, 3-4

or

Twelve semester hours selected from the following: Art 31-32, 71-72; Engl 41-42, 51-52, 71-72, 91-92; Foreign Language (2 years of one language); Mus 3, 4; Phil 61-62; Rel 9, 10, 59-60; Slav 91-92

Semester
Hours

12

Natural Science

Six to eight semester hours selected from the following: B Sc 3-4, 11-12; Chem 3-4; Geol 1-2, 3, 4; Phys 1, 2, 9-10

6-8

Mathematics

Six semester hours selected from the following: Math 3, 6, 9, 10, 30, 31; Stat 51, 52, 101-2

6

Social Sciences

Two full-year courses† are required, each course chosen from one of two departments, selected from the following: AmCv 71-72; Anth 1-2; Econ 1-2; Geog 51 and 52; Hist 39-40, 71-72; P Sc 5-6; Psyc 1 and 8, 1 and 22, 1 and 29; Soc 1-2

12

Elective (depending on science option).....

10-12

60

THIRD AND FOURTH YEARS

Concentrations are offered in History, Mathematics, Political Science, and Psychology.

Concentration Requirements (to be selected in consultation with the faculty adviser):

100-level courses in the department of the selected area of concentration....

24‡

100-level courses in two or more related departments.....

18‡

Elective

18

Total

120

BACHELOR OF SCIENCE IN GENERAL STUDIES

Faculty Advisers: First two years—Edson G. Hammer, College of General Studies. F-15A; Telephone: 676-7016. Third and fourth years—Robert F. Hartley, Associate Professor of Business Administration. Hall of Government; Telephone: 676-6069.

* Students who plan to continue study for advanced degrees are urged to fulfill the 2-year language option.

† Geography and Regional Science and Psychology courses listed are not full-year courses; however, if a student elects one of these options, he must elect Geog 51 and 52, or Psyc 1 and 8, or 1 and 22, or 1 and 29.

‡ Students selecting psychology as an area of concentration are required to take 18 semester hours of 100-level Psychology courses and 24 semester hours of 100-level courses in two or more related departments.

The Bachelor of Science in General Studies curriculum aims to provide the adult part-time student with the opportunity to obtain a broad education in preparation for careers in accounting or business administration. The course work required in the first and second years is distributed among Communications (written and oral), the Humanities, Natural Science and Mathematical Sciences, the Social Sciences, and Business and Economics. In choosing the third- and fourth-year course work required in departments related to their concentration, students should obtain counseling through the faculty adviser.

Students planning to work toward Master's degrees are advised to plan their Bachelor's programs so that they will meet the prerequisite requirements of the school or college of their choice.

SCHOLARSHIP

The system of grading and computing scholarship is described in detail on pages 14-15. For regulations concerning probation, suspension, and readmission, see pages 16-17.

To remain in good standing and to qualify for graduation, a student must maintain a general quality-point index of 2.00 and a quality-point index of at least 2.50 in his area of concentration.

FIRST AND SECOND YEARS

Communications

Engl 1 or 1x, 2.....

Semester
Hours
6

Humanities

Six semester hours selected from the following: Art 31; Engl 51-52, 71-72, 91-92; Foreign Language (1 full year of a foreign language); Mus 3; Phil 61-62

6

Natural Science and Mathematical Sciences

Math 30, 31.....

Stat 51 or 101.....

Six to eight semester hours selected from the following: B Sc 3-4; Chem 3-4; Geog 51, 52; Geol 1-2, 3, 4; Phys 1, 2, 9-10.....

6

3

6-8

Social Sciences

Psyc 1, 8.....

Six semester hours selected from the following: Anth 1, Hist 71-72, P Sc 5-6, Soc 1.....

6

6

Business and Economics

Acct 1-2* or 115.....

B Ad 51.....

Econ 1-2

3-6

3

6

4-9

Elective

60

* Students selecting Accounting as an area of concentration should elect Acct 1-2.

THIRD AND FOURTH YEARS

Concentrations are offered in Accounting and Business Administration.

Required Courses	Semester Hours
Acct 193	3
B Ad 102, 105, 118, 131, 141, 161, 178 or 198, 196.....	24
Econ 121	3
Psyc 144	3
Elective (to be selected from Business Administration or related departments such as Accounting or Economics).....	12
Elective (to be selected in consultation with the Faculty Adviser).....	15
Total	120

BACHELOR OF SCIENCE IN GEODETIC AND
CARTOGRAPHIC SCIENCE

Faculty Adviser: Hyman Orlin, Professorial Lecturer in Geodetic and Cartographic Science. Telephone: 946-3557. Counseling by appointment only, telephone: 676-7013.

Only a portion of the course work in this four-year curriculum is offered on campus. The Cartography, Geodesy, Geophysics, and Oceanography courses are given at the Environmental Science Services Administration, the Naval Oceanographic Office, and the U.S. Army Topographic Command, which have the necessary facilities. Since these installations are some distance from the campus, students should plan to provide their own transportation.

Entrance requirements are stated on pages 24-26; residence requirements are stated on page 26.

ADVANCED STANDING

Twelve semester hours of credit may be granted upon the successful completion of validating examinations. *Note that no credit will be given for courses taken in correspondence schools or service schools.*

SCHOLARSHIP

The system of grading is described on pages 14-15. For regulations regarding probation, suspension, and readmission, see pages 16-17.

To remain in good standing and to qualify for graduation, a student must maintain grades of High Pass or Honors in half of the courses taken in one of the two areas of concentration: (1) *Cartography*—Cart 103, 104, 111, 112, Geod 13, 110; (2) *Geodesy*—Geod 13, 110, 155, 156, 160, Geop 105.

CURRICULUM

Required—First Year	Semester Hours
Engl 1, 2: English Composition	6
Geog 51: Introduction to Geography.....	3

	Semester Hours
Math 30: Precalculus	3
Math 31: Calculus of One Variable.....	3
Phys 1: General Physics	4
Phys 2: Introduction to Modern Physics.....	4
Social Sciences: To be selected from the following.....	6
AmCv 71-72: Introduction to American Civilization	
Anth 1-2: Introductory Anthropology	
Econ 1-2: Principles of Economics	
Hist 39-40: European Civilization in Its World Context	
P Sc 5-6: Introduction to Political Science	
Soc 1-2: Introductory Sociology	
Elective: Selected in consultation with the adviser (Geog 52 recom- mended)	3

Total..... 32

Required—Second Year

Cart 1-2: Introduction to Cartography.....	6
Chem 11-12: General Chemistry	8
Engl 51-52: Introduction to English Literature, or	6
Engl 71-72: Introduction to American Literature.....	3
Geol 1 or 3: Introductory Geology.....	3
Math 32: Calculus of Several Variables.....	3
Math 33: Calculus of Vector Functions.....	3
Stat 107: Statistics for Engineers	3

Total..... 32

Required—Third Year

Cart 107: Geomorphology	3
Geod 12: Plane Surveying	3
Geod 13: Geodetic Surveying	3
Geod 17: Elementary Photogrammetry	3
Geod 18: Intermediate Photogrammetry	3
Geop 105: Elementary Geophysics.....	3
Math 111: Mathematics for Engineers and Physicists I.....	3
Math 112: Mathematics for Engineers and Physicists II.....	6
Ocea 101-2: Elementary Oceanography	3

Total..... 30

Group Options

Two areas of specialization are open to students in this program; students select one at the beginning of the fourth year.

Required—Fourth Year

GROUP I: CARTOGRAPHY

Cart 103-4: Photo Interpretation	6
Cart 111: Cartographic Techniques	3

THE BACHELOR'S DEGREES 31

	Semester Hours
Cart 112: Advanced Cartography	3
Geod 110: Map Projections	3
Elective: Courses in Cartography, Geodesy, Geophysics, and Oceanography selected in consultation with the adviser.....	11
Total.....	26

GROUP II: GEODESY

Geod 110: Map Projections	3
Geod 155: Elementary Geodesy	3
Geod 156: Geodetic Astronomy	3
Geod 160: Mathematics of Adjustments and Least Squares.....	3
Elective: Courses in Cartography, Geodesy, Geophysics, and Oceanography selected in consultation with the adviser.....	14
Total.....	26

BACHELOR OF SCIENCE IN OCEANOGRAPHY

Faculty Adviser: Hyman Orlin, Professorial Lecturer in Geodetic and Cartographic Science. Telephone: 946-3557. Counseling by appointment only, telephone: 676-7013.

Only a portion of the course work in this four-year curriculum is offered on campus. The Cartography, Geodesy, Geophysics, and Oceanography courses are given at the Environmental Science Services Administration, the Naval Oceanographic Office, and the U.S. Army Topographic Command, which have the necessary facilities. Since these installations are some distance from the campus, students should plan to provide their own transportation.

Entrance requirements are stated on pages 24-26; residence requirements are stated on page 26.

ADVANCED STANDING

Twelve semester hours of credit may be granted upon the successful completion of validating examinations. *Note that no credit will be given for courses taken in correspondence schools or service schools.*

SCHOLARSHIP

The system of grading is described on pages 14-15. For regulations concerning probation, suspension, and readmission, see pages 15-16.

To remain in good standing and to qualify for graduation, a student must maintain grades of High Pass or Honors in half of the following courses: Geop 105; Ocea 101-2; and 9 semester hours selected from Geol 125, Ocea 110, 111, 112, 113, 114, 115.

CURRICULUM

<i>Required—First Year</i>	Semester Hours
Engl 1, 2: English Composition	6
Math 30: Precalculus	3
Math 31: Calculus of One Variable	3

	Semester Hours
Phys 1: General Physics	4
Phys 2: Introduction to Modern Physics	4
Social Sciences: To be selected from the following.....	6
AmCv 71-72: Introduction to American Civilization	
Anth 1-2: Introductory Anthropology	
Econ 1-2: Principles of Economics	
Hist 39-40: European Civilization in Its World Context	
P Sc 5-6: Introduction to Political Science	
Soc 1-2: Introductory Sociology	6
Elective: To be selected from the following.....	
Art 31-32: Survey of Western Art	
Art 71-72: Introduction to the Arts in America	
Geog 51: Introduction to Geography	
Geog 52: World Regional Patterns	
Mus 3: Introduction to Musical Understanding	
Mus 4: Survey of Music Literature	
Phil 61-62: Introduction to Philosophy	
Rel 9: The Old Testament	
Rel 10: The New Testament	
Rel 21: Introduction to Religious Thought	
Rel 59-60: History of Religions	
Total.....	32
Required—Second Year	
Cart 1-2: Introduction to Cartography	6
Chem 11-12: General Chemistry	8
Engl 51-52: Introduction to English Literature, or	6
Engl 71-72: Introduction to American Literature.....	3
Geol 1 or 3: Introductory Geology.....	3
Geol 2 or 4: Introductory Geology	3
Math 32: Calculus of Several Variables.....	3
Math 33: Calculus of Vector Functions	3
Total.....	32
Required—Third Year	
Cart 107: Geomorphology	3
Cart 108: Climatology	3
Geop 105: Elementary Geophysics	3
Math 111: Mathematics for Engineers and Physicists I.....	3
Math 112: Mathematics for Engineers and Physicists II.....	3
Ocea 11: Navigation	6
Ocea 101-2: Elementary Oceanography	3
Stat 107: Statistics for Engineers.....	3
Elective:	30
Total.....	30
Required—Fourth Year	
Ocean Science: To be selected from the following.....	12
Geol 125: Marine Geology	
Ocea 110: Ocean Dynamics	

	Semester Hours
Ocea 111: Ocean Waves and Tides	
Ocea 112: Biological Oceanography	
Ocea 113: Marine Geophysics	
Ocea 114: Chemical Oceanography	
Ocea 115: Geological Oceanography	
Elective: Courses in Biological Sciences, Chemistry, Geology, Geophysics, Oceanography, and Physics, selected in consultation with the adviser.....	14
Total.....	26

BACHELOR OF SCIENCE IN ENVIRONMENTAL HEALTH

Faculty Advisers: First two years—Edson G. Hammer, College of General Studies. F-15A; Telephone: 676-7016. Third and fourth years—J. W. Millar, Vivian Gill Professor of Epidemiology and Environmental Health, School of Medicine. Telephone: 331-6117.

The Bachelor of Science in Environmental Health curriculum is designed to provide students with the requisite training to function effectively as Environmental Health Officers in domestic and foreign areas. Candidates are prepared for participation in community or regional program planning, community education, staff personnel training, and supervision in official or voluntary health organizations.

Entrance requirements are stated on pages 24-26; residence requirements on page 26.

The determination of acceptability of a student to the program leading to the degree of Bachelor of Science in Environmental Health will be made by the faculty advisers appointed by the Department of Epidemiology and Environmental Health and Columbian College of Arts and Sciences. The decision to accept a student must be unanimous. The degree is granted by Columbian College of Arts and Sciences and is administered by the College of General Studies.

Scholarship.—To remain in good standing and to qualify for graduation, a student must maintain grades of High Pass or Honors in half the courses taken in the major area of concentration.

The system of grading is described on pages 14-15. For regulations concerning probation, suspension, and readmission, see pages 16-17.

FIRST AND SECOND YEARS

	Semester Hours
Communications	
Engl 1 or 1x, 2.....	6
Engl 11; Sp&D 111 or 121.....	6
Humanities	
Hum 1-2, 3-4 or Twelve semester hours selected from the following: Engl 41-42, 51-52, 71-72, 91-92; Foreign Language (2 years of one language); Phil 61-62.....	12

	Semester Hours
Natural Science	
B Sc 11-12, Chem 11-12.....	16
Mathematics	
Six semester hours selected from the following: Math 3, 6, 9, 10, 30, 31; Stat 51-52, 101-2.....	6
Social Sciences	
A full-year course* in one department selected from the following: Anth 1-2; Econ 1-2; Psyc 1 and 8, 1 and 22; Soc 1-2.....	6
†Elective (Epid 1, 2, and 3 recommended).....	8
	60

THIRD AND FOURTH YEARS

Concentration Requirements (to be selected, in consultation with the adviser, from the following Epidemiology and Environmental Health courses).... 25

- Environmental Sanitation—Epid 101, 102, 103, 104
- Preventive Medicine and Environmental Health—Epid 121, 122, 123, 131
- Public Health Entomology—Epid 141, 142, 143, 144
- Public Health Microbiology—Epid 151, 152, 153, 154
- Environmental and Occupational Health—Epid 171, 172
- Public Health Administration—Epid 191, 192

Elective

- 100-level courses in two or more related departments in consultation with the faculty adviser, selected from Anthropology, Biological Sciences, Chemistry, Geology, Psychology, and Sociology..... 35

Total..... 120

Master of Science in Administration‡

THE SCHOOL OF GOVERNMENT AND BUSINESS ADMINISTRATION has academic jurisdiction over the degree of Master of Science in Administration. This degree program provides a course of study appropriate for those students currently working in government or industry. It is a professional degree, preparing graduates for positions of higher and broader responsibility and generally improving their competence as administrators. Students expecting to continue in a doctoral program should consult the Committee on Doctoral Studies in the School of Government and Business Administration concerning appropriate electives.

The University cannot guarantee that all courses in this curriculum will be offered at every off-campus center. However, any student who has been ad-

* Psychology courses listed here are not full-year courses. However, if a student elects Psychology courses, he must elect Psyc 1 and 8 or 1 and 22.

† Electives selected with the approval of the adviser.

‡ Not open to students in the Military Cooperative Programs.

mitted to degree candidacy may arrange to complete his curriculum by registering on campus. In general, campus registration is limited to the last 12 hours of a degree program.

REQUIREMENTS FOR ADMISSION TO MASTER'S CANDIDACY

Application for Master's candidacy *must* be made before or immediately after starting course work. No more than 6 semester hours of credit toward the degree will be granted for work taken in nondegree status (before application and while the application is being processed).

The general requirement for Master's candidacy is a Bachelor's degree from a regionally accredited college or university with an over-all quality-point index of 3.00 (a *B* average), adequate undergraduate preparation for the chosen graduate field, and satisfactory performance on the Admission Test for Graduate Study in Business*. Students with below *B* undergraduate averages may qualify by their scores on the Admission Test for Graduate Study in Business. Students who lack the necessary undergraduate background for the chosen graduate field may qualify by earning a *B* or better in prescribed undergraduate courses.

The Admission Test for Graduate Study in Business must be taken prior to application for degree candidacy or during the semester in which application is made. For information concerning the date and place for taking the test, contact the Educational Testing Service, Box 955, Princeton, N.J. 08540.

ADVANCED STANDING

A maximum of 6 semester hours of advanced standing may be credited toward the degree by transfer of credit for approved graduate work taken at an accredited college or university.

Students who are not certain that they will be in this area long enough to complete the degree requirements should be aware that most institutions will accept only 6 hours of transfer credit toward a Master's degree.

REQUIREMENTS FOR THE DEGREES

RESIDENCE

A minimum of 24 semester hours of graduate work must be completed while registered as a degree candidate in this off-campus program.

The thesis and thesis seminar (6 semester hours) may be included in the 24 hours of course work taken in residence. A graduate student who transfers from another division of the University is required to have a minimum of 12 hours of course work as a degree candidate in this off-campus program.

SCHOLARSHIP

An average of *B* or better is required for the Master's degree. The grade of *C* is not considered as failing but must be counter-balanced by a grade of *A* in a graduate course of equal status. A student whose scholarship is unsatisfactory may be suspended.

*This is a test of general aptitude and does not presume an undergraduate major in Business Administration.

THESIS

With the approval of the adviser, a thesis may be substituted for 6 semester hours of course work.

The thesis subject and the thesis in its final form must be approved by the director of the thesis and the faculty adviser and presented to the dean no later than the date announced in the calendar. Printed copies of detailed regulations regarding the form and reproduction of the thesis are available at the Office of Counseling and Student Records, College of General Studies.

Payment of tuition for the thesis entitles the candidate, during the two semesters he registers for thesis (299-300), to the advice and direction of the member of the faculty under whom the thesis is to be written. In case a thesis is unfinished, an additional successive academic year is granted without further tuition payment. The student must, however, maintain continuous registration during this period. If the preparation of the thesis extends more than three semesters beyond the date the student registers for thesis 300, he must register for the entire 6 hours of thesis again and pay tuition as for a repeated course.

COURSE SUBSTITUTION

It is the responsibility of the student to get written approval from the faculty adviser prior to registration for any course substitution. Forms for requesting substitution are available at the Office of Counseling and Student Records, College of General Studies.

MASTER'S COMPREHENSIVE EXAMINATION

The Master's candidate is required to pass a written Master's Comprehensive Examination. Before applying for the examination, the student must have completed all of the courses in his program, and he must have maintained a 3.00 (B) average. In writing the examination, the student is expected to correlate what he has learned in his course work and his reading in the literature of the field. The examinations are conducted at the University in December for students graduating in February and in April for students graduating in June.

REQUIRED COURSES

	Semester Hours
Mgt 201: Advanced Administrative Management.....	3
*Mgt 204: Quantitative Factors in Administration.....	3
Mgt 207: Human Behavior in Organizations.....	3
Mgt 218: Survey of Data Processing.....	3
Mgt 287: Relations of Government to Business.....	3
Econ 220: Survey of Principles and Issues in Economics.....	18
Area of Concentration:	12-18
Elective: To be selected with the approval of the adviser.....	0-6
Total.....	36

* Mgt 204 is waived for students electing Management Science-Operations Research as an area of concentration.

Areas of Concentration

I. AUTOMATIC DATA PROCESSING

Faculty Adviser: John F. McCarthy, Jr., Associate Professor of Business Administration. Hall of Government; Telephone: 676-7089.

This area of concentration provides a broad understanding of the principles of manual, mechanical, and electronic data processing, including computer programming concepts, methods, and languages; an appreciation of the capabilities and the limitations of data processing equipment; a knowledge of the phases of management information systems development; and an understanding of management's role in data processing. It provides an appreciation of the role of data processing as a tool of management.

	Semester Hours
Mgt 219: Digital Computer Programming Concepts.....	3
Mgt 220: Comparative Digital Computer Systems and Their Management	3
Mgt 221: Management Information Systems Development and Application	3
Mgt 223: Management of a Data Processing Organization.....	3
Total.....	12

II. BUSINESS FINANCIAL MANAGEMENT

Faculty Adviser: Edward J. Mock, Associate Professor of Business Finance. Building Y, Room 10, 2131 G Street, N.W.; Telephone: 676-7095.

This area of concentration provides a background in business budgeting, controllership, treasury, long-range planning, reporting, and financial management processes. Courses are designed to emphasize the planning, analysis, implementation, and controls necessary for making effective financial decisions.

	Semester Hours
Acct 215: Survey of Managerial Accounting.....	3
B Ad 231: Financial Decision Making.....	3
B Ad 232: Seminar: Capital Resource Management.....	3
B Ad 233: Seminar: International Business Finance.....	3
B Ad 237: Investment Analysis	3
Mgt 225: Introduction to Managerial Statistics.....	3
Total.....	18

III. BUSINESS MANAGEMENT

Faculty Adviser: George Frederick Conner, Assistant Professor of Business Administration. Hall of Government; Telephone: 676-7097.

This area of concentration, with its prerequisites, provides the essentials of business administration with emphasis upon managing the finance, production, marketing, and accounting functions of a business firm. These functions are integrated in a final course using actual business cases.

PREREQUISITE

Nine semester hours in Mathematics, 6 semester hours in Economics, and 3 semester hours each in Accounting, Business Administration, and Statistics

	Semester Hours
Acct 215: Survey of Managerial Accounting.....	3
B Ad 225: Seminar: Manufacturing Production.....	3
B Ad 231: Financial Decision Making.....	3
B Ad 241: Advanced Marketing Management.....	3
B Ad 297: Case Studies in Business Administration.....	3
Total.....	15

IV. GOVERNMENTAL ADMINISTRATION

Faculty Adviser: Daniel R. Cloutier, Professor of Public Administration. Hall of Government; Telephone: 676-6295.

This area of concentration emphasizes policy formulation and administration in government. It provides the broad dimensions of public administration for those preparing for managerial responsibility in the public service.

	Semester Hours
P Ad 213: Administration in Government.....	3
P Ad 231: Public Personnel Administration.....	3
P Ad 251: Governmental Budgeting.....	3
P Ad 252: Problems in Planning, Programming, and Budgeting.....	3
P Ad 260: Seminar: Policy Formulation and Administration.....	3
Total.....	15

V. INDUSTRIAL PERSONNEL MANAGEMENT

Faculty Adviser: Joe L. Jessup, Professor of Business Administration. Hall of Government; Telephone: 676-6068.

This area of concentration provides a basic academic and professional foundation, equipping the student for administrative responsibility in industrial personnel management. The courses cover the fields of personnel management, industrial relations, unionism, collective bargaining, labor relations, and manpower development and utilization.

	Semester Hours
B Ad 208: Personnel Management and Industrial Relations.....	3
B Ad 209: Seminar: Personnel Management.....	3
B Ad 212: Unionism and Collective Bargaining.....	3
B Ad 213: Current Issues in Unionism, Collective Bargaining, and Labor Relations	3
P Ad 233: Seminar: Manpower Development and Utilization.....	3
Total.....	15

VI. INTERNATIONAL COMMERCE

Faculty Adviser: Geza P. Lauter, Associate Professor of Business Administration. Hall of Government; Telephone: 676-7374.

This area of concentration prepares students for careers in firms operating on a multinational basis or about to enter the international field; for careers in the federal government and in international agencies concerned with business, industry, and finance abroad; and for the Commerce option of the Foreign Service Officer Examination.

	Semester Hours
B Ad 233: Seminar: International Business Finance.....	3
B Ad 248: International Marketing.....	3
B Ad 255: Seminar: International Trade I.....	3
B Ad 256: Seminar: International Trade II.....	3
B Ad 257: Operation of the Multinational Firm	3
Total.....	15

VII. MANAGEMENT ENGINEERING

Faculty Adviser: Jack W. Waldrup, Assistant Professor of Management. Building Y, Room 21, 2131 G Street, N.W.; Telephone: 676-7139.

This area of concentration provides a background for industrial management. Courses cover organization and functioning of industrial firms, and the management practice and problems of such firms.

	Semester Hours
B Ad 225: Seminar: Manufacturing Production.....	3
B Ad 229: Administration of Research and Development.....	3
B Ad 280: Procurement and Contracting.....	3
B Ad 297: Case Studies in Business Administration.....	3
Mgt 224: Theory and Management of Systems.....	3
Total.....	15

VIII. MANAGEMENT SCIENCE-OPERATIONS RESEARCH*

Faculty Adviser: Robert L. Holland, Associate Professor of Management Science. Hall of Government; Telephone: 676-7375.

This area of concentration develops a thorough understanding of quantitative or mathematical approaches to problems of managerial control and decision making. While the program will develop a competent background in basic mathematical theory associated with the various techniques, the program is oriented towards applications of the techniques rather than their theoretical mathematical content.

	Semester Hours
Mgt 225: Introduction to Managerial Statistics.....	3
Mgt 226: Managerial Statistics	3
Mgt 227: Mathematical Programming: Techniques and Applications..	3
Mgt 229: Seminar: Management Science and Operations Research.....	3

*B&PA 204 Quantitative Factors in Administration is waived in this area of concentration.

Other courses: To be selected from the following as approved by the adviser

B Ad 261: Managerial Economics I

B Ad 262: Managerial Economics II

*B Ad 295: Business Decision Simulation

Mgt 219: Digital Computer Programming Concepts

Mgt 220: Comparative Digital Computer Systems and Their Management

Mgt 228: Systems Analysis by Simulation

Total..... 18

IX. MANAGERIAL ACCOUNTING

Faculty Adviser: Anthony J. Mastro, Associate Professor of Accounting. Hall of Government; Telephone: 676-6055.

This area of concentration, with its prerequisites, provides a knowledge of interrelated system of accounting in planning and control for management. Emphasis is on the requirements of management for accounting information with concern for general and corporate accounting principles to the extent related to the managerial accounting functions.

PREREQUISITE

Six semester hours of introductory accounting principles or equivalent, and adequate undergraduate preparation as approved by the Faculty Adviser.

	Semester Hours
Acct 231: Contemporary Accounting Theory.....	3
Acct 241: Accounting and Related Disciplines.....	3
Acct 276: Management Planning and Control.....	3
Acct 295: Seminar in Accounting.....	3
Mgt 219: Digital Computer Programming Concepts.....	3

Total..... 15

X. PROCUREMENT AND CONTRACTING

Faculty Adviser: Stanley N. Sherman, Assistant Professor of Business Administration. Hall of Government; Telephone: 676-7462.

This area of concentration provides a basic academic and professional foundation, equipping the student for administrative responsibility in procurement and contracting. The courses cover industrial purchasing, procurement activities of the federal government, and contracting activities of vendors to the federal government.

	Semester Hours
B Ad 279: Purchasing and Materials Management.....	3
B Ad 280: Procurement and Contracting.....	3
B Ad 282: Government Contract Administration.....	3
B Ad 283: Pricing and Negotiation.....	3
B Ad 285: Systems Procurement and Project Management.....	3

Total..... 15

* Offered on campus only.

XI. PUBLIC FINANCIAL MANAGEMENT AND BUDGETING

Faculty Adviser: Stephen R. Chitwood, Assistant Professor of Public Administration. Hall of Government; Telephone: 676-6295.

This area of concentration provides a broad foundation for work in governmental planning, programming, budgeting; and for controllership and related financial management activities. Its main stress is on financial processes and decision making in the public service.

	Semester Hours
Acct 215: Survey of Managerial Accounting.....	3
Econ 218: Survey of Economics.....	3
P Ad 213: Administration in Government.....	3
P Ad 251: Governmental Budgeting.....	3
P Ad 252: Problems in Planning, Programming, and Budgeting.....	3
Total.....	15

XII. PUBLIC PERSONNEL MANAGEMENT

Faculty Adviser: Waldo Sommers, Professor of Public Administration. Hall of Government; Telephone: 676-6792.

This area of concentration provides a basic academic and professional foundation, equipping the student for administrative responsibility in public personnel management. The courses cover the federal administrative organization and process; principles, functions, and problems of personnel administration in the public service; unionism and collective bargaining; and manpower development and utilization.

	Semester Hours
B Ad 212: Unionism and Collective Bargaining.....	3
P Ad 213: Administration in Government.....	3
P Ad 231: Public Personnel Administration.....	3
P Ad 232: Problems in Public Personnel Management.....	3
P Ad 233: Seminar: Manpower Development and Utilization.....	3
Total.....	15

XIII. SYSTEMS MANAGEMENT

Faculty Adviser: Marvin M. Wofsey, Associate Professor of Management. Building D, Room 403, 2129 G Street, N.W.; Telephone: 676-7183.

This area of concentration provides a basic academic and professional foundation, equipping the student for administrative responsibility in computer-based systems. The courses cover computers, data processing, operations research, and the theory and management of systems.

	Semester Hours
*B Ad 295: Business Decision Simulation.....	3
Mgt 220: Comparative Digital Computer Systems and Their Management	3

* Offered on campus only.

	Semester Hours
Mgt 223: Management of a Data Processing Organization.....	3
Mgt 224: Theory and Management of Systems.....	3
Total.....	12

ELECTIVES

Unless a student elects to write a thesis, he may select electives appropriate to his program from graduate courses offered by the School of Government and Business Administration. To choose electives from other related departmental offerings in this University, the student must obtain the written approval of the faculty adviser. A form for this purpose may be obtained from the Office of Counseling and Student Records, College of General Studies.

Master of Science*

THE SCHOOL OF ENGINEERING AND APPLIED SCIENCE in cooperation with the National Aeronautics and Space Administration's Langley Research Center, Hampton, Virginia, has a graduate engineering program at NASA-Langley. NASA-Langley's extensive scientific and engineering facilities and equipment are available to students in this program.

The programs at NASA-Langley lead to the degree of Master of Science in the fields of Acoustics, Aerospace Engineering (including options in Aeronautics and Astronautics), Computer Science, and other fields in electrical and mechanical engineering. These programs are open to qualified NASA employees and area residents. With the approval of the instructor, courses may be taken in nondegree status.

The School of Engineering and Applied Science in cooperation with the Naval Ship Research and Development Laboratory, Annapolis, Maryland, has a graduate engineering program leading to the degree of Master of Science in the fields of electrical engineering and in Ocean Sciences and Engineering. The programs are open to qualified NSRDL employees and area residents. Classroom facilities at the U.S. Naval Academy are available for this program.

The School of Engineering and Applied Science has academic jurisdiction over these degree programs which are administered by the College of General Studies.

ADMISSION

Admission to graduate study toward a Master's degree requires an appropriate Bachelor's degree from a recognized institution and evidence of capacity for productive work in the field selected, as indicated by undergraduate grades, Graduate Record Examination scores, and similar data.

An applicant who has significant deficiencies in preparation may be required to take prescribed undergraduate courses as an unclassified student before

* For course descriptions, see the *School of Engineering and Applied Science* catalogue.

being admitted to graduate student status. In some cases, if such deficiencies are minimal, he may be admitted to graduate student status and allowed to take a limited number of graduate courses while completing the undergraduate courses in which he is deficient. In no case may the undergraduate courses thus taken fulfill any part of the requirements for the Master's degree.

TRANSFER CREDIT

Up to 6 semester hours of satisfactory credit (with grades of *A* or *B*), which normally must have been earned in a graduate program at another recognized institution, may be accepted in transfer, when applicable, to satisfy Master's degree requirements in the School of Engineering and Applied Science. However, the student must, with the approval of his adviser, petition to the appropriate department chairman for such a transfer.

REQUIREMENTS FOR THE DEGREE

The minimum program consists of 24 semester hours of approved graduate courses in the major field and area of concentration, a Master's thesis (equivalent to 6 semester hours), and a Master's Comprehensive Examination. Students whose undergraduate study does not include necessary prerequisites may be required to take more than 30 semester hours.

Upon admission the student is assigned an adviser. Programs of study are determined by any prerequisites established and the requirements of the department in which the student wishes to study. The program of studies in preparation for the Master's Comprehensive Examination must be approved by the student's adviser and the appropriate department chairman.

SCHOLARSHIP

For Master's work, a minimum of 24 semester hours of graduate course work with the grade of *B* or higher is required for graduation. Students who receive two grades of *F*, or three grades below *B*, are barred from further enrollment in graduate courses and, ordinarily, will not be readmitted to graduate study. Students who receive the grade of *C* in one or two courses are required to take additional course work to make up the minimum 24 semester hours of work with grades of *B*.

RESIDENCE

In general, a minimum of one year of full-time study, or the equivalent in part-time study, must be completed in the School of Engineering and Applied Science.

MASTER'S THESIS

The degree candidate must submit an acceptable thesis to demonstrate his ability to make independent use of the knowledge and discipline of thought acquired and developed by graduate study, to furnish objective evidence of constructive power in a given field, and to demonstrate that he can communicate the results of his work in writing. Work of a suitable character for which the

student has professional responsibility may be considered, whether done on or off campus, provided no significant amount of work is completed without faculty supervision.

As a part of registration for the thesis course 299, the candidate must submit to the appropriate department chairman (on the form obtainable at the School office) his thesis area, approved by his faculty adviser. He must submit his thesis title to the Dean, on the form available in the School office, at the beginning of the semester in which he expects to graduate. Registration in thesis 299-300 entitles the student, during such registration, to the advice of the member of the faculty under whom the thesis is to be written. He may consult his adviser, but the thesis is the exclusive responsibility of the student.

The thesis in final form must be submitted to the appropriate department chairman by the date stated in the calendar for the semester in which the candidate enrolls in thesis 300. In case a thesis is unfinished on the date specified, the student will be granted an additional semester and must pay the "Continuous Registration" fee (see page 10) unless he is registered for course work. If the preparation of the thesis extends beyond the three semesters, approval for an extension of time will be required and the student must reregister for thesis 300 and pay tuition as for a repeated course.

A thesis may be submitted in final form one time. The acceptability of the thesis is determined exclusively by the Master's Comprehensive Examination committee. If the thesis is unacceptable, the student's graduate status is terminated.

Printed copies of detailed regulations regarding the form and reproduction of the thesis are available in the Office of the School. Accepted theses, with accompanying drawings, become the property of the University and are deposited in the University Library and the School's Library, where the duplicate copies are bound and made available for circulation. Permission to publish or adapt material in them must be secured from the Dean.

MASTER'S COMPREHENSIVE EXAMINATION

After completing his prescribed program and submitting his thesis, the candidate must pass a Master's Comprehensive Examination, to demonstrate substantial understanding of principles and method and their use in the area of his interest. This Examination may be written, oral, or both. A graduate student who fails any portion of the Master's Comprehensive Examination on his first attempt may be examined one more time if approval is given by the appropriate Examining Committee. In the event of failure to complete the Examination satisfactorily, the student's graduate status terminates.

TIME TO COMPLETE MASTER'S DEGREE REQUIREMENTS

A full-time Master's candidate is allowed a maximum of three calendar years to complete all degree requirements, from the date of his first graduate-student status registration in prerequisite or graduate courses. A part-time Master's candidate is allowed a maximum of five calendar years. The time limit does not include any period of registration as an unclassified student before admission to graduate student status, nor does it encompass any specified period spent on approved leave of absence. Readmission is required upon expiration of leave of absence under the conditions and requirements then prevailing.

Students who do not complete degree requirements within the allowed time have their graduate status terminated. They may be readmitted to graduate status under conditions specified by the department chairman and approved by the Dean.

Master of Engineering Administration

THE SCHOOL OF ENGINEERING AND APPLIED SCIENCE in cooperation with the Naval Ship Research and Development Laboratory, Annapolis, Maryland, has a graduate engineering program leading to the degree of Master of Engineering Administration. The program is open to qualified NSRDL employees and area residents. Classroom facilities at the U.S. Naval Academy are available for this program.

The School of Engineering and Applied Science has academic jurisdiction over this degree program which is administered by the College of General Studies.

With the exception of the additional admission requirements, below, admission and requirements for the degree of Master of Engineering Administration are the same as those listed under the degree of Master of Science (see pages 42-43).

ADMISSION TO ENGINEERING ADMINISTRATION

The applicant must have an adequate knowledge of the principles of human relations, the fundamentals of accounting, and the fundamentals of statistics. This requirement can be met by satisfactory completion of the following undergraduate courses or approved equivalents: Accounting 115, *Survey of Accounting*; Engineering Administration 115, *Probabilistic and Statistical Methods in Engineering*; and Psychology 145, *Psychology of Management*. A student is required to earn the grade of C or better (unless the requirement is stipulated to be a grade of B or better upon his admission) in each undergraduate pre-requisite course. If this scholarship requirement is not met the student is barred from further enrollment. A student is not permitted to repeat any of the undergraduate prerequisite courses. Credit for prerequisite courses is not applicable toward the degree of Master of Engineering Administration.

Military Cooperative Programs

IN COOPERATION with the Industrial College of the Armed Forces, Fort McNair, Washington, D.C., a program of study is offered leading to the degree of Master of Science in Administration. The School of Government and Business Administration has academic jurisdiction over this program which is open only to current students and faculty of the Industrial College of the Armed Forces.

In cooperation with the National War College, Fort McNair, Washington, D.C.; and the Naval War College, Newport, R.I., a special program of study is offered leading to the degree of Master of Science in International Affairs.

The School of Public and International Affairs has academic jurisdiction over this program which is open only to current War College students and faculty.

Robert Carter Burns, M.A., *Director, National War College Center, Fort McNair, Washington, D.C.*

Burton Malcolm Sapin, Ph.D., *Faculty Adviser, National War College, Fort McNair, Washington, D.C. and Naval War College, Newport, R.I.*

Hiram Miller Stout, Ph.D., *Director, Naval War College Center, Newport, R.I.*

Harry Robert Page, Ph.D., *Faculty Adviser, Industrial College of the Armed Forces, Fort McNair, Washington, D.C.*

Noncredit Programs

CONFERENCES, SEMINARS, AND INSTITUTES

THE COLLEGE OF GENERAL STUDIES presents a variety of conferences, seminars, and institutes designed to meet the needs of business, industry, and professional groups. Activities are scheduled on campus and at Airlie House Conference Center near Warrenton, Virginia.

For further information, consult Robert Carter Burns, M.A., Director of Special Programs, College of General Studies; Telephone 676-7049.

Continuing Education for Women

Director Ruth H. Osborn, M.A., Ed.D.

Assistant Director Abbie O. Smith, M.A. in Ed.

Counselors Ruth N. Basom, M.N.; Jan D. Green, M.A.; Lois Northrop, M.S.; Marjorie Parks, M.A.

Assistant to the Director Elisabeth P. Clarkson, B.A.

MANY WOMEN wish to resume an interrupted education on a part-time basis when their homemaking responsibilities permit. They feel the need to return to the classroom to update their education, prepare for new careers, participate more effectively in community affairs, or enrich their own lives through a sense of personal growth. The Continuing Education for Women program has been developed to meet these needs.

To help women focus their interests and achieve their goals, Continuing Education for Women offers (1) a group guidance course, *Developing New Horizons for Women*, (2) off-campus credit courses at hours and locations convenient for women, (3) selected noncredit courses, (4) academic counseling for women entering degree and nondegree programs in the College of General Studies, and (5) cooperation with other organizations in developing women's educational programs.

DEVELOPING NEW HORIZONS FOR WOMEN

Developing New Horizons for Women is offered each semester to help women develop their potential through understanding themselves as individuals and as

women; gaining confidence in their abilities; and becoming acquainted with educational, occupational, and community service opportunities. There are no prerequisites for this course. Most of the women enrolling are homemakers with school-age children. They range in age from 21 to 60. Although some have no previous college education, approximately one-half have Bachelor's degrees, and others have earned graduate degrees. More than 1,500 women have completed this program since it was originated at George Washington University in 1964.

Developing New Horizons for Women is a 15-week noncredit course, and includes lectures, group discussions, guest speakers, psychological testing, and individual counseling. Participants attend class one day a week from 10 a.m. to 12:30 p.m. One section meets on campus and other sections meet in nearby Maryland and Virginia. During the final five weeks all sections meet on campus to hear guest speakers.

After completing this course, approximately one-half of the women enroll in some type of educational program at George Washington University or at other colleges and universities. Others obtain jobs or locate opportunities for significant volunteer service. Some combine part-time study with part-time employment.

OFF-CAMPUS CREDIT COURSES

To enable women with home responsibilities to continue their formal education, the College of General Studies offers credit courses off campus. These courses, which may be taken for undergraduate or graduate credit, meet at hours and locations convenient for homemakers. Classroom space has been provided by churches and community centers in Alexandria, Annandale, Arlington, Falls Church, McLean, and Springfield, Virginia; Bethesda, Chevy Chase, Kensington, Rockville, and Takoma Park, Maryland; as well as the District of Columbia.

Each credit course meets once a week for two and one-half hours during the day when children are in school. Although many women take these courses to meet requirements for degree programs, they are also accepted in nondegree status. Many who successfully complete off-campus credit courses in nondegree status are encouraged to apply for degree candidacy at George Washington University. Other women need only specific courses to qualify for positions in business or government; some who already hold academic degrees wish to qualify for professional certification in such fields as teaching or guidance. Credits earned may also be transferred to other colleges and universities throughout the country.

NONCREDIT COURSES

Selected noncredit courses supplementing the academic programs of the University are offered through the Continuing Education for Women program. Among those offered each semester are *Introduction to Social Work*, a 15-week seminar scheduled to acquaint women with the social service structure of the metropolitan area, the needs of people in an urban environment, and opportunities for significant volunteer or subprofessional work; *How to Study*, a 4-week course to help students understand the factors which contribute to a better adjustment in pursuit of their academic goals; and *Introduction to Cre-*

ative Thinking, a 9-week workshop exploring the nature, purposes, and techniques of creativity, idea evaluation, and problem solving. A series on *Women's Role in World Affairs* began in the spring semester of 1970. Other noncredit courses are also scheduled.

ACADEMIC COUNSELING

The professional staff of Continuing Education for Women counsels women interested in enrolling in degree and nondegree programs in the College of General Studies. Counselors are available at the Off-campus Centers at the time of registration. Appointments can also be made for counseling at the Office of Continuing Education for Women.

COMMUNITY DEVELOPMENT

The Continuing Education for Women staff cooperates with community organizations, women's educational groups, and other colleges and universities in developing educational programs for women.

For further information about the programs of Continuing Education for Women, telephone 676-7036, or write to Continuing Education for Women, College of General Studies, 2029 K Street, N.W., Washington, D.C. 20006. Descriptive brochures and semester course schedules are available.

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Aberdeen Proving Ground, Md. 21005

Education Director: John L. Lichy, Chief, Educational Services Division

Office: Army Education Center, Building 3146

Telephone: Area code 301, 278-3385

Field Representative for the University: Michael G. O'Connor

Telephone: 676-7023

Open to military and civilian personnel attached to the Aberdeen Proving Ground and Edgewood Arsenal and to other personnel by permission

Accounts, Bureau of (see Department of the Treasury)

Alexandria Public Schools, Alexandria, Va. 22314

John Albaum, Superintendent of Schools

Office: 418 S. Washington Street

Telephone: 549-9100

Andrews Air Force Base, Md. 20331

Education Director: Lt. Dennis Murphy

Office: Room 4, Building 3484

Telephone: 981-6377

Field Representative for the University: Joseph E. Johnston

Telephone: 676-7022

Open to military and civilian personnel of the Air Force and to others by permission of the Commanding Officer

Anne Arundel County Public Schools, Annapolis, Md. 21402

Mrs. Ruth Dudderar, Assistant Superintendent

Office: Anne Arundel County Board of Education, Green Street

Telephone: Area code 301, 268-3345

Arlington County Public Schools, Arlington, Va. 22201

Harold Mack, Director, Secondary Education

Office: 1426 N. Quincy Street

Telephone: 522-7700

Army Map Service (see U.S. Army Topographic Command, Corps of Engineers)

Bolling Air Force Base, Washington, D.C. 20332

Education Director: Anthony Witkowski
 Office: Room 205, Building P-20
 Telephone: 574-5348
 Field Representative for the University: Joseph E. Johnston
 Telephone: 676-7022
 Open to military and civilian personnel of the Air Force and to others by permission of the Commanding Officer

Building T-7, Gravelly Point, Washington, D.C. 20315

Education Director and Chairman of the Department of Defense Education and Training Advisory Council: Philip F. Strauss
 Office: Room 3C147, The Pentagon
 Telephone: 697-8015 or 697-2823

ARMY MATERIEL COMMAND

Program Coordinator: Mrs. Lois Richards
 Office: Room 2524, Building T-7
 Telephone: 697-9279
 Employee Development Officer: Reading Black
 Office: Room 1534, Building T-7
 Telephone: 697-0341
 Field Representative for the University: William C. Robinson
 Telephone: 676-7064
 Open only to active duty military personnel and Department of Defense civilians.

Bureau of the Census, Washington, D.C. 20233

Education Directors: James Vawter, Chief, Employee Development Branch, Personnel Division; John Hickey, Employee Development Officer, Personnel Division
 Office: Room 1370, Building FOB 3, Suitland, Md.
 Telephone: Area code 301, 440-1524
 Field Representative for the University: Edward B. Wright
 Telephone: 676-7024
 Open to all employees of the Bureau of the Census and the Naval Oceanographic Office and to others by permission

***Bureau of Customs, Washington, D.C. 20226**

Education Director: James J. Doherty, Director, Training and Career Development
 Office: 2100 K Street, N.W.
 Telephone: 964-8000
 Field Representative for the University: Robert W. Stewart, Jr.
 Telephone: 676-7018
 Open to employees of the Department of the Treasury and to personnel of other government agencies by permission

***Bureau of Domestic and International Business, Washington, D.C. 20230**

Education Directors: David Sullivan, Chief, Employee Development Branch; Mike Patchan, Jr., Employee Development Officer
 Office: Room 1003, Commerce Department Building, 14th Street and Constitution Avenue, N.W.
 Telephone: 967-2501 or 967-7075 or 967-7076

Field Representative for the University: Robert W. Stewart, Jr.
Telephone: 676-7018
Open to employees of the Department of Commerce and to personnel of other government agencies by permission

***Bureau of Narcotics and Dangerous Drugs, Washington, D.C. 20573**

Education Director: N.E. Benton, Personnel Officer
Office: Room 605, 1405 Eye Street, N.W.
Telephone: 382-4231
Field Representative for the University: Robert W. Stewart, Jr.
Telephone: 676-7018

Bureau of Naval Personnel, Washington, D.C. 20370

Education Director: John K. Wilkerson, Head, Training and Incentive Awards Section
Office: Room 1706, Arlington Annex
Telephone: 694-1269
Field Representative for the University: William C. Robinson
Telephone: 676-7064
Open only to active duty military personnel and Department of Defense civilians

Calvert County Public Schools, Prince Frederick, Md. 20678

Maurice A. Dunkle, Superintendent of Schools
Office: Calvert County School Board, Dares Beach Road
Telephone: Area code 301, 535-1700

Charles County Public Schools, LaPlata, Md. 20646

Charles Stackey, Assistant Superintendent
Office: Charles County Board of Education, Health and Education Building
Telephone: Area code 301, 934-4671

***Civil Service Commission, Washington, D. C. 20415**

Education Director: John W. Murtha, Director of Personnel
For information contact Employee Development Officer, Personnel Division, Room 1679, 1900 E Street, N.W.
Telephone: 632-5400
Field Representative for the University: Robert W. Stewart, Jr.
Telephone: 676-7018
Open to employees of the Civil Service Commission and to personnel of other government agencies by permission

Coast and Geodetic Survey (see Environmental Science Services Administration)

***Coast Guard, Washington, D.C. 20591**

Education Directors: Jasper L. Kranke, Supervisory Training Officer; Carl W. Easton, Training Officer
Office: Room 7301, NASSIF Building, 7th and D Streets, N.W.
Telephone: 962-7718

Field Representative for the University: Robert W. Stewart, Jr.

Telephone: 676-7018

Open to employees of the Coast Guard and to personnel of other government agencies by permission

David Taylor Model Basin (see Naval Ship Research and Development Center)

***Department of Justice, Washington, D.C. 20530**

Education Director: Daniel Keenan, Departmental Training Officer

Office: Room 1229, Justice Department Building, 10th Street and Pennsylvania Avenue, N.W.

Telephone: 737-8200, Extension 3256

Field Representative for the University: Robert W. Stewart, Jr.

Telephone: 676-7018

Open to employees of the Department of Justice and to personnel of other government agencies by permission

***Department of Labor, Washington, D.C. 20210**

Education Director: Kenneth R. Bute

Office: Room 6137, Labor Department Building, 14th Street and Constitution Avenue, N.W.

Telephone: 961-2101

Field Representative for the University: Robert W. Stewart, Jr.

Telephone: 676-7018

Open to employees of the Department of Labor and to personnel of other government agencies by permission

Department of State, Washington, D.C. 20520

Liaison Officer: Mrs. Barbara Morlet, Training Specialist, Extension Studies Program,
Office for Academic Relations

Office: Room 1106, Foreign Service Institute, State Annex 3, Washington, D.C.
Telephone: 383-8549 or 383-5919

Field Representative for the University: Robert W. Stewart, Jr.

Telephone: 676-7018

Open to employees of the Department of State, C.I.A., A.I.D., and U.S.I.A.

***Department of the Treasury, Washington, D.C. 20226**

BUREAU OF ACCOUNTS

Education Director: Mrs. Hale A. Ament, Employee Development Officer
Office: Room 112, Treasury Annex Number 1, Pennsylvania Avenue and Madison Place, N.W.

Telephone: 964-5565

Field Representative for the University: Robert W. Stewart, Jr.

Telephone: 676-7018

Open to employees of the Department of the Treasury and to personnel of other government agencies by permission

***District of Columbia Government, Washington, D.C. 20001**

Education Directors: Benjamin J. Ludwig, Chief of Training; C. Howard Larson, Employee Development Officer

Office: Room 211, District of Columbia Government Building, 499 Pennsylvania Avenue, N.W.

Telephone: 629-2270 or 629-2997

Field Representative for the University: Robert W. Stewart, Jr.

Telephone: 676-7018

Open to employees of the District of Columbia Government and to personnel of other government agencies by permission

Edgewood Arsenal, Md. 21010

Education Director: R.G. Mehr

Office: Army Education Center, Building 4475

Telephone: Area code 301, 676-1000, Extension 21153

Field Representative for the University: Michael G. O'Connor

Telephone: Area code 202, 676-7023

Open to military and civilian personnel attached to Edgewood Arsenal and Aberdeen Proving Ground and other personnel by permission

Education Courses for Teachers (see separate listings under individual Public Schools)**Environmental Science Services Administration, Rockville, Md. 20852**

Education Directors: Mrs. Muriel Christgau, Employee Development Specialist, Personnel Division; Paul F. Murphy, Employee Development Officer

Office: Room 208, Building 5, Washington Science Center, Rockville, Md.

Telephone: 496-8261

Field Representative for the University: Edward B. Wright

Telephone: 676-7024

Type of Program Offered: undergraduate and graduate courses leading to the Bachelor's and Master's degrees offered off-campus

Open to all employees of the Department of Commerce and to others by permission

Fairfax County Public Schools, Fairfax, Va. 22150

W. Harold Ford, Assistant Superintendent for Instruction

Office: 10700 Page Avenue

Telephone: 273-6500

***Federal Aviation Administration, Washington, D.C. 20590**

Education Director: Mrs. Phyllis Burbank, Employee Development Specialist

Office: Room 509, 800 Independence Avenue, S.W.

Telephone: 962-1803

Field Representative for the University: Robert W. Stewart, Jr.

Telephone: 676-7018

Open to employees of the Federal Aviation Administration and to personnel of other government agencies by permission

***Federal Communications Commission, Washington, D.C. 20554**

Education Director: Robert M. Brown
Office: Room 208, 1919 M Street, N.W.
Telephone: 632-7120

Field Representative for the University: Robert W. Stewart, Jr.
Telephone: 676-7018

Open to employees of the Federal Communications Commission and to personnel of other government agencies by permission

Federal Reserve System, Washington, D.C. 20551

Education Coordinator: Miss Sudelle Rice, Personnel Technician
Office: Federal Reserve Building, 20th Street and Constitution Avenue, N.W.
Telephone: 737-1100, Extension 404

Field Representative for the University: Robert W. Stewart, Jr.
Telephone: 676-7018

Open to all government employees and others by permission

Fort Belvoir, Va. 22060

Education Director: Eric Eber; John Ivers, Education Adviser
Office: Building T-1483
Telephone: 664-3154 or 664-4546

Field Representative for the University: John W. Gaffney
Telephone: 676-7063

Open to military and civilian personnel of the Army and to other government employees by permission of the Commanding Officer

Fort Eustis, Va. 23604

Education Director: John Williams
Office: Building S711, Educational Development Services, Lee Blvd. and 12th Street
Telephone: Area code 703, 878-3731 or 878-5508

Director for the University at George Washington University Center (Tidewater Area), Fort Monroe, Va.: Robert C. Sedwick

Office: Building T-181

Telephone: Area code 703, 727-3363 or 727-3770

Open to military and civilian personnel of the Army and to other government employees by permission of the Commanding Officer

Fort McNair, Washington, D.C. 20315

Educational Adviser: Miss Margaret Lockwood
Office: Building 20A, Second Floor, Post Education Center
Telephone: 527-9400, Extension 268

Field Representative for the University: Joseph E. Johnston
Telephone: 676-7022

Open to military and civilian personnel of the Army and to other government employees by permission of the Commanding Officer

Fort George G. Meade, Md. 20755

Education Director: Gustaf E. Berglund
Office: Building 303, Army Education Center
Telephone: Area code 301, 677-6421

Field Representative for the University: Michael G. O'Connor
 Telephone: 676-7023
 Open to military and civilian personnel of the Army and to other government employees by permission of the Commanding Officer

Fort Monroe, Va. 23351

Education Director: Henry C. Stone
 Office: Casemate 22, Education Center
 Telephone: Area code 703, 727-2454 or 727-3692
 Norfolk Office: Room 610, Building N23, N.O.B., Norfolk, Va. 23351
 Telephone: Area code 703, 423-2839
 Director for the University at George Washington University Center (Tidewater Area), Fort Monroe, Va.: Robert C. Sedwick
 Office: Building T-181
 Telephone: Area code 703, 727-3363 or 727-3770
 Open to military and civilian personnel of the Army and to other government employees by permission of the Commanding Officer

Fort Myer, Va. 22208

Educational Adviser: Miss Margaret Lockwood
 Office: Building 604, South Area, Post Education Center
 Telephone: 697-0607
 Field Representative for the University: Joseph E. Johnston
 Telephone: 676-7022
 Open to military and civilian personnel of the Army and to other government employees by permission of the Commanding Officer

Frederick Community College, Frederick, Md. 21701

Dean of Instructional Services: C.H. Mithelner
 Telephone: Area code 301, 662-0101
 Field Representative for the University: Jack B. Ferguson
 Telephone: 676-7067

Gramax Building, 8060 13th Street, N.W., Silver Spring, Md. 20910

Education Directors: Mrs. Muriel Christgau, Employee Development Specialist, Personnel Division; Paul F. Murphy, Employee Development Officer
 Office: Room 208, Building 5, Washington Science Center, Rockville, Md.
 Field Representative for the University: Edward B. Wright
 Telephone: 676-7024
 Type of Program Offered: undergraduate and graduate courses leading to the Bachelor's and Master's degrees offered off-campus
 Open to all employees of the Department of Commerce and to others by permission

Gravelly Point (see Building T-7)

Harford Junior College, Bel Air, Md. 21014

Neal F. Warrington, Associate Dean
 Office: Administration Building
 Telephone: Area code 301, 734-7171

Field Representative for the University: Michael G. O'Connor
Telephone: 676-7023

Industrial College of the Armed Forces, Fort McNair, Washington, D.C. 20315

Project Officer: Col. Haydon J. Price, USA
Office: Room 206, Industrial College of the Armed Forces
Telephone: 695-8305
Director for the University: Edwin Timbers
Office: Room 206, Hall of Government, 710 21st Street, N.W.
Telephone: 676-6825

Type of Program Offered: graduate courses leading to the degree of Master of Science in Business Administration
Open to students and faculty of the Industrial College of the Armed Forces

***Internal Revenue Service, Washington, D.C. 20224**

Education Directors: D.C. Barry, Chief, National Office Training Branch; Miss Ruby Bennett, Employee Development Training Officer
Office: Room 1315, Internal Revenue Service Building, 12th Street and Constitution Avenue, N.W.
Telephone: 964-3931 or 964-6101
Field Representative for the University: Robert W. Stewart, Jr.
Telephone: 676-7018
Open to employees of the Department of the Treasury and to personnel of other government agencies by permission

***Interstate Commerce Commission, Washington, D.C. 20423**

Education Director: Samuel D. Bingman, Jr., Training Officer
Office: Room 1420, Interstate Commerce Building, 1200 Constitution Avenue, N.W.
Telephone: 373-9765, Extension 7116
Field Representative for the University: Robert W. Stewart, Jr.
Telephone: 676-7018
Open to employees of the Interstate Commerce Commission

Langley Air Force Base, Va. 23365

Education Director: Robert J. Dewey
Office: Building 1347
Telephone: Area code 703, 764-3520
Director for the University at George Washington University Center (Tidewater Area), Fort Monroe, Va.: Robert C. Sedwick
Office: Building T-181
Telephone: Area code 703, 727-3363 or 727-3770
Open to military and civilian personnel of the Air Force and to other government employees by permission of the Commanding Officer

Loudoun County Public Schools, Leesburg, Va. 22075

Caleb J. Gibson, Director of Instruction
Mrs. Ruth D. Schulke, Supervisor, Elementary Education
Office: Loudoun County School Board, 20 Union Street
Telephone: Area code 703, 777-2570

Main Navy Building, Washington, D.C. 20360

Education Directors: Thomas W. Gill, Head, Employee Development Division, CAPSO-N; Miss Kathleen V. Sullivan, Employee Development Officer, Program Coordinator; Mrs. Ruth R. Crouch, Employee Development Officer
Office: Room 0116, Main Navy Building, Constitution Avenue at 17th Street, N.W.

Telephone: 696-6155 or 696-7704

Field Representative for the University: Robert Engle

Telephone: 676-7025

Open to military and civilian personnel of the Department of Defense and to other government employees, retired military personnel, and Department of Defense contractors by permission

Melpar Division of American Standard, Falls Church, Va. 22046

Education Director: Anthony B. DePasquale, Personnel Relations Manager
Office: 7700 Arlington Blvd.

Telephone: 560-5000, Extension 2450

Field Representative for the University: John W. Gaffney

Telephone: 676-7063

Open to selected personnel by permission of the Personnel Relations Manager

Montgomery County Public Schools, Rockville, Md. 20850

Charles Proctor, Director, Staff Development
Office: Montgomery County School Board, 850 N. Washington Street

Telephone: 762-5000, Extension 395

NASSIF Building, 5611 Columbia Pike, Falls Church, Va. 22041

Education Director and Chairman of the Department of Defense Education and Training Advisory Council: Philip F. Strauss

Office: Room 3C147, The Pentagon

Telephone: 697-8015 or 697-2823

ARMY AUDIT AGENCY

Program Coordinator: Cyril E. Davis

Office: Room 319, NASSIF Building

Telephone: 692-2291

ARMY MATERIEL COMMAND

Program Coordinator: Mrs. Lois Richards

Office: Room 2524, Building T-7

Telephone: 697-9279

MILITARY TRAFFIC MANAGEMENT AND TERMINAL SERVICE

Program Coordinator: Miss Marjorie C. Mays

Office: Room 734, NASSIF Building

Telephone: 692-1644

Field Representative for the University: William C. Robinson

Telephone: 676-7064

Open only to active military personnel and Department of Defense civilians

National Bureau of Standards Graduate School, Washington, D.C. 20234

Registrar: Mrs. Virginia Maxwell

Office: Room A-123, Administration Building, Gaithersburg, Md.

Telephone: 921-1000, Extension 3498

Field Representative for the University: Edward B. Wright

Telephone: 676-7024

Open to all employees of the National Bureau of Standards—also to all employees of other government agencies and to all American citizens, providing they meet the formal prerequisites

National Naval Medical Center, Bethesda, Md. 20014

Nicholas J. Szabados, Head, Training and Educational Services

Office: Room 32, Building 7

Telephone: 295-0574

Field Representative for the University: Edward B. Wright

Telephone: 676-7024

Open to military and civilian personnel of the Navy, employees of the National Institutes of Health, and to others as space permits

National Science Foundation, D.C. 20550

Training Officer: Herbert L. Morris

Office: 1800 G Street, N.W.

Telephone: 632-4107

Field Representative for the University: Robert W. Stewart, Jr.

Telephone: 676-7018

Open to all government employees by permission of the National Science Foundation

National War College, Fort McNair, Washington, D.C. 20315

Project Officer: Col. Vaughan Miller, Jr., USAF

Office: Room 217, National War College

Telephone: 695-8490

Director for the University: R.C. Burns

Telephone: 676-7049

Type of Program Offered: graduate courses leading to the degree of Master of Science in International Affairs

Open to students and faculty of the National War College

Naval Oceanographic Office, Suitland, Md. 20390

Mrs. Barbara Courtney, Employee Development Specialist

Office: Room G-124, Building FOB 3

Telephone: Area code 301, 763-1560

Field Representative for the University: Edward B. Wright

Telephone: 676-7024

Type of Program Offered: undergraduate and graduate courses leading to the Bachelor's and Master's degrees

Open to military and civilian personnel of the Navy, employees of the Census Bureau; others may obtain permission to attend by calling the Career Development

Office, Telephone 763-1560

Naval Ordnance Station, Indian Head, Md. 20640

H.J. Rhodes, Head, Employee Development Division; Mrs. D. Barron and Donald Jehlik, Employee Development Specialists
 Office: Civilian Personnel Department, Building D-71
 Telephone: Area code 301, 743-5511, Extension 280 or 480
 Field Representative for the University: Edward B. Wright
 Telephone: 676-7024
 Open to military and civilian personnel of the Navy and to others by permission of the Commanding Officer

Naval Ship Research and Development Center, Carderock, Md. 20007

Education Director: Lorik F. Fox, Head, Training Division
 Office: Room 113A, Building 8
 Telephone: 995-1501
 Field Representative for the University: Edward B. Wright
 Telephone: 676-7024
 Open to military personnel and civilian employees of the Naval Ship Research and Development Center and to others by permission of the Commanding Officer

Naval Ship Research and Development Laboratory, Annapolis, Md. 21402

Education Director: Price Mosher
 Office: Training Center, Building 42
 Telephone: Area code 301, 268-7711, Extension 8210
 Field Representative for the University: Michael G. O'Connor
 Telephone: Area code 202, 676-7023
 Open to military and civilian personnel of the Navy and to others by permission of the Commanding Officer

Naval Supply Center, Norfolk, Va. 23511

Education Director: Mrs. Mary K. Lawson, Director, Industrial Relations Department
 Office: Building W-143
 Telephone: Area code 703, 444-2144 or 444-4912
 Norfolk Office: Room 610, Building N23, N.O.B., Norfolk, Va.
 Telephone: Area code 703, 423-2839
 Director for the University at George Washington University Center (Tidewater Area), Fort Monroe, Va.: Robert C. Sedwick
 Office: Building T-181
 Telephone: Area code 703, 727-3363 or 727-3770
 Open to military and civilian personnel of the Navy and to other government employees by permission of the Commanding Officer

Naval War College, Newport, R.I. 02840

Project Officer: Col. N.L. Chapin, USA
 Office: Room 113, Luce Hall
 Telephone: Area code 401, 841-3021
 Director for the University at Newport: Clyde B. Sargent
 Office: Room 361, Pringle Hall
 Telephone: Area code 401, 849-2200
 Type of Program Offered: graduate courses leading to the degree of Master of Science in International Affairs
 Open to faculty and students of the Naval War College

***Patent Office, Washington, D.C. 20231**

Education Director: Willis Hokans, Employee Development Officer
Office: Room 2-9C-27, Building 2, Crystal Plaza, 2011 Jefferson Davis Highway,
Arlington, Va.
Telephone: 557-3431
Field Representative for the University: Robert W. Stewart, Jr.
Telephone: 676-7018
Open to employees of the Department of Commerce and to personnel of other gov-
ernment agencies by permission

The Pentagon, Washington, D.C. 20310

Director of the Pentagon Education Center, Chairman of the Department of Defense
Education and Training Advisory Council, and Education Officer for the U.S.
Army: Philip F. Strauss
Assistant to the Director: George L. Bowman
Office: Room 3C147
Telephone: 697-2823 or 697-6805 or 697-8015

U.S. AIR FORCE

Education Officer: Anthony J. Witkowski
Office: Room 5E410
Telephone: 697-1863 or 697-7074
Field Representative for the University: William C. Robinson
Pentagon Desk: Reception Center on the Concourse
Telephone: 697-3141
University Telephone: 676-7064
Open only to active duty military personnel and Department of Defense civilians

***Post Office Department, Washington, D.C. 20260**

Education Directors: Francis J. Mahaney; J.A. Matukonis, Training Division, Bureau
of Personnel
Office: Room 205, 6900 Wisconsin Avenue, Chevy Chase, Md.
Telephone: 656-9125
Field Representative for the University: Robert W. Stewart, Jr.
Telephone: 676-7018
Open to employees of the Post Office Department and to personnel of other gov-
ernment agencies by permission

Prince Georges County Public Schools, Upper Marlboro, Md. 20870

Edward Turner, Director of Staff Development
Office: Prince Georges County School Board
Telephone: 627-4800

St. Mary's County Public Schools, Leonardtown, Md. 20650

Robert S. King, Jr., Superintendent of Schools; James Ogden, Assistant Superintend-
ent of Schools
Office: St. Mary's County School Board of Health Building
Telephone: Area code 301, GReenwood 5-9141

Seaford Senior High School, Seaford, Del. 19973

Principal: M.R. Milleran
 Telephone: Area code 302, 629-4584
 Field Representative for the University: Jack B. Fergerson
 Telephone: 676-7067

Social Security Administration, Baltimore, Md. 21235

Employee Development Specialist: Eric Levi
 Office: Division of Training and Development, Room 4-P-10 Annex, 6401 Security Blvd.
 Telephone: Area code 301, 944-5000, Extension 5396
 Field Representative for the University: Frank Dulong
 Telephone: 676-7064
 Open to employees of the Social Security Administration and to others by permission

The Susquehanna Corporation, Alexandria, Va. 22314

Education Director: Frederick H. Black, Jr., Corporate Director of Training
 Office: Room 201A, Corporate Headquarters Building, Shirley Highway at Edsall Road
 Telephone: 354-3400, Extension 510
 Field Representative for the University: John W. Gaffney
 Telephone: 676-7063
 Open to selected personnel by permission of the Corporate Director of Training

Tidewater Area, Va. (see Fort Monroe)**U.S. Army Topographic Command, Corps of Engineers, Washington, D.C. 20315**

Education Directors: Jerome E. McClain, Chief, Training and Development Division; Mrs. Connie Clem, Personnel Specialist
 Office: Erskine Hall, 6500 Brooks Lane, N.W.
 Telephone: 986-2384 or 986-2385
 Field Representative for the University: Edward B. Wright
 Telephone: 676-7024
 Type of Program Offered: undergraduate courses leading to the degrees of Bachelor of Science in Geodetic and Cartographic Science and Bachelor of Science in Oceanography
 Open to employees of the U.S. Army Topographic Command and others by permission, obtained at least one week prior to the first week of classes, from the Training and Development Division, telephone 986-2384

U.S. Marine Corps Base, Quantico, Va. 22134

Education Officer: Major C.O. Broughton, USMC
 Office: Education Office, Building 2005
 Telephone: Area code 703, 640-2826
 Field Representative for the University: John W. Gaffney
 Telephone: 676-7063
 Open to military personnel and their dependents and civilian personnel attached to the Marine Corps Base. Other selected personnel may be admitted by permission of the Commanding Officer

U.S. Naval Academy, Annapolis, Md. 21402

Coordinator for the University Programs: William W. Jeffries, Senior Professor, Department of English, History, and Government, U.S. Naval Academy

Office: Maury Hall

Telephone: Area code 301, 268-7711, Extension 642

Field Representative for the University: Michael G. O'Connor

Telephone: Area code 202, 676-7023

Open to military and civilian personnel attached to the Academy and other personnel by permission of the Naval Academy

U.S. Naval Air Station, Patuxent River, Md. 20670

Training Director: E.G. Russell, Head, Employee Development Division; Mrs. Wanda Denton, Employee Development Specialist

Office: Civilian Personnel Department, Naval Air Station, Building 463

Telephone: Area code 301, 863-3734 or 863-3735

Field Representative for the University: Edward B. Wright

Telephone: 676-7024

Open to military and civilian personnel of the Navy and to others

U.S. Naval School of Hospital Administration, Bethesda, Md. 20014

Commanding Officer: Capt. R.M. Tennille, Jr., MSC, USN

Academic Director: LCdr. G.J. Pearce, MSC, USN

Office: Room 131, Building 141

Telephone: 295-1314

Field Representative for the University: Edward B. Wright

Telephone: 676-7024

Open to military personnel assigned to duty under instruction at the U.S. Naval School of Hospital Administration

Veterans Administration, Washington, D.C. 20420

Education Directors: Raymond L. Butler, Chief, Employee Relations and Training Division; Philip L. Loomis, Assistant Chief, Employee Relations and Training Division

Office: Room 100, Veterans Administration Main Building, Vermont Avenue and H Street, N.W.

Telephone: 389-3101

Field Representative for the University: Robert W. Stewart, Jr.

Telephone: 676-7018

Open to employees of the Veterans Administration and to personnel of other government agencies by permission

Wesley Junior College, Dover, Del. 19901

Academic Dean: R.P. Carson

Assistant Academic Dean: C.A. Johnson

Telephone: Area code 302, 734-8211

Field Representative for the University: Jack B. Fergerson

Telephone: 676-7067

COURSES OF INSTRUCTION

ON THE FOLLOWING PAGES OF THIS CATALOGUE, under the alphabetically arranged names of the departments of instruction, are listed the courses of instruction offered by the College of General Studies. The courses are subject to change. The University reserves the right to withdraw any course announced.

EXPLANATION OF COURSE NUMBERS

Courses are assigned dual numbers. The first is a serial number assigned by the College of General Studies at the time of registration. The serial number does not appear in this catalogue and is used to distinguish one class from another when the same course is offered simultaneously at different places. The second number is the course number assigned by the department and indicates the academic level of each course, as follows:

First-group courses.—Courses numbered from 1 to 100 are planned for students in the freshman and sophomore years. With the approval of the adviser and the dean, they may also be taken by juniors and seniors. In certain instances, they may be taken by graduate students to make up undergraduate deficiencies or as prerequisite to advanced courses, but they may not be credited toward a higher degree.

Second-group courses.—Courses numbered from 101 to 200 are planned for students in the junior and senior years. They may be taken for graduate credit only upon the approval of the dean and the instructor at the time of registration. Such approval is granted only with the provision that students must complete additional work in order to receive graduate credit.

Third-group courses.—Courses numbered above 200 are planned primarily for graduate students. They are open, with the approval of the instructor, to qualified seniors; they are not open to other undergraduates. Qualified seniors registering for Accounting, Business Administration, Health Care Administration, Management Science, or Public Administration courses must have a 3.00 average, the prior approval of the department chairman who is responsible for the graduate course, the prior approval of the faculty adviser, and the prior approval of the Dean of the School of Government and Business Administration.

SEMESTER HOURS OF CREDIT

The number of semester hours of credit given for the satisfactory completion of a course is, in most cases, indicated in parentheses after the name of the course. Thus, a year course giving 3 hours of credit each semester is marked (3-3), and a semester course giving 3 hours of credit is marked (3). A semester hour usually consists of the completion of one fifty-minute period of class work or of one laboratory period a week for one semester.

ABBREVIATIONS

In the description of courses in this catalogue, the following abbreviations are used:

Acct	Accounting	Hum	Humanities
Anth	Anthropology	I Af	International Affairs
Art	Art	Ital	Italian
B Sc	Biological Sciences	Jour	Journalism
B Ad	Business Administration	L Am	Latin American Civilization
Cart	Cartography	Mgt	Management Science
Chem	Chemistry	Math	Mathematics
Chin	Chinese Language and Literature	Mus	Music
Econ	Economics	Ocea	Oceanography
Educ	Education	Phil	Philosophy
Engl	English	PE	Physical Education
Epid	Epidemiology and Environmental Health	Phys	Physics
Fren	French	P Sc	Political Science
Geod	Geodesy	Psyc	Psychology
Geog	Geography and Regional Science	P Ad	Public Administration
Geol	Geology	Rel	Religion
Geop	Geophysics	Slav	Slavic Languages and Literatures
Germ	Germanic Languages and Literatures	Soc	Sociology
HCA	Health Care Administration	Span	Spanish
Hist	History	S Ed	Special Education
		Sp&D	Speech and Drama
		Stat	Statistics
		Swed	Swedish

Accounting

Chairman: A.J. Mastro, Associate Professor of Accounting; Hall of Government, Telephone: 676-6055

1-2 Introductory Accounting (3-3)

Preparation, uses, and limitations of financial reports. Acct 1: basic financial reporting concepts and data accumulation and processing. Acct 2: introduction to managerial accounting—financial programming, cost determination, and analysis of financial statements. Acct 1 is prerequisite to Acct 2.

101 Cost Accounting (3)

Theory and purposes of industrial cost accounting, systems of cost control and determination, analysis and interpretation of cost data. Prerequisite: Acct 1-2.

111 Financial Statement Analysis (3)

Methods and techniques of preparing, analyzing, and interpreting financial statements for the guidance of operating executives, directors, stockholders, and creditors. Prerequisite: 6 semester hours of accounting or permission of instructor.

115 Survey of Accounting (3)

Preparation, uses, and limitations of financial information in the management process. Not open for credit to Accounting majors.

121-22 Intermediate Accounting (3-3)

Acct 121: accounting for assets and liabilities. Prerequisite: Acct 1-2 or permission of instructor. Acct 122: partnership, corporation, consignment, and installment-sales accounting. Prerequisite: Acct 121 or permission of instructor.

141 Governmental Accounting (3)

Appropriation, encumbrance, and fund accounting for governmental and institutional entities. Prerequisite: Acct 1-2 or permission of instructor.

144 Federal Accounting (3)

Accounting procedures in the Federal Government; emphasis on agency-level accounts and accounting support for cost-based budgets. Prerequisite: Acct 141 or permission of instructor.

161 Federal Income Taxation (3)

Federal income tax concepts applicable to individuals and corporations, differences between tax accounting and financial accounting. Prerequisite: Acct 1-2 or permission of instructor.

171 Auditing (3)

Duties and responsibilities of auditors: principles and procedures of making audits, techniques of verifying financial statement items, preparation of audit working papers and reports. Prerequisite: Acct 121-22.

181 Accounting Systems (3)

Theory and procedure of designing and installing systems for collecting, recording, analyzing, and presenting accounting and other business data. Prerequisite: Acct 101, 121-22, and 171; or permission of instructor.

191 Advanced Accounting (3)

Consolidated statements, statement of affairs, realization and liquidation reports, and estate and trust accounting. Prerequisite: Acct 121-22.

193 Business Budgeting (3)

Principles, techniques, and procedures involved in the development, installation, and operation of a system of budgetary control to aid in management of commercial and industrial organizations. Prerequisite: Acct 1-2.

215 Survey of Managerial Accounting (3)

Nature, preparation, analysis, and interpretation of accounting reports; cost accounting, business budgeting, and internal accounting controls and their use in the management process. Prerequisite: Acct 1-2 or 115.

231 Contemporary Accounting Theory (3)

Advanced accounting principles and concepts and recent theories concerned with the valuation and amortization of assets and determination of income. Prerequisite: 6 semester hours of accounting and permission of instructor.

241 Accounting and Related Disciplines (3)

Relationship between accounting and such related disciplines as economics, statistical theory, and operations research; emphasis on what the accountant has to offer to these allied fields and on new ideas and requirements these fields may offer or impose upon accounting. Prerequisite: 6 semester hours of accounting.

276 Management Planning and Control (3)

Theories and techniques of cost accounting and budgetary planning and control, with emphasis on: the relation of planning and control systems to corporate and departmental objectives; control of decentralized operations and discretionary costs; long-range planning and control. Prerequisite: Acct 101 and B Ad 102 or Mgt 201, or permission of instructor.

295 Seminar in Accounting (3)

Selected accounting research topics and problems; individual oral and written reports. Admission by permission of instructor; may be repeated once for credit.

Anthropology

Chairman: R.K. Lewis, Associate Professor of Anthropology; X-11, Telephone: 676-6075

1-2 Introductory Anthropology (3-3)

Anth 1: survey of man's origin, physical evolution, and culture history.
Anth 2: a survey of the world's cultures, illustrating the principles of cultural behavior.

Art

Chairman: L.P. Leite, Professor of Art; Stuart Basement (front), Telephone: 676-6085

31-32 Survey of Western Art (3-3)

Survey of the arts in the Western World from prehistoric to modern times. A foundation for further study in the history of art.

71-72 Introduction to the Arts in America (3-3)

Painting, sculpture, and architecture of America, with selected references to crafts and popular arts. Art 71: from Colonial beginnings to the Republican Age. Art 72: from early 19th century to the present.

110 Contemporary Art (3)

Painting and sculpture in 20th century Europe.

Biological Sciences

Chairman: A.H. Desmond, Professor of Zoology; C-314, Telephone: 676-6090

BIOLOGY

3-4 Introductory Biology for Nonscience Majors (3-3) (Campus Course)

Lecture (2 hours), laboratory (2 hours). Survey of biological principles; emphasis on man as a functional organism in his environment. Material fee, \$10 a semester.

11-12 Introductory Biology for Science Majors (4-4) (Campus Course)

Lecture (3 hours), laboratory (3 hours). Biological principles and problems designed to furnish a base for advanced studies in biology and related sciences. Required of all prospective biology, botany, and zoology majors. Material fee, \$10 a semester.

Business Administration

Chairman: H.R. Page, Professor of Business Administration; Hall of Government, Telephone: 676-6115

51 Introduction to Business (3)

The business environment; structure, activities, and problems of business enterprise; its contribution to society; careers in business.

102 Fundamentals of Management (3)

Planning, organizing, directing, coordinating, and controlling activities of the administrative unit; evolution of management thinking.

103 Institutional Management (3)

Philosophy of hospital administration: special services, food service, maintenance, internal review.

105 Personnel Management (3)

The labor force and labor markets. Industrial personnel and manpower programs, organizations and policy in personnel activities.

106 Problems in Personnel Management (3)

Principles and problems of personnel management and industrial relations illustrated by cases drawn from industry and government. Prerequisite: B Ad 105.

107 Collective Bargaining (3)

Characteristics of American unionism and collective bargaining; economic, social, and public policy considerations. Management's role in the negotiation and administration of collective bargaining agreements. Prerequisite: B Ad 105 or permission of instructor.

109 Office Management (3)

Organization and management of the office, office and information systems, planning and execution of work, systems analysis supervision problems.

111-12 Personnel Records Administration (3-3)

B Ad 111: basic principles, techniques, and methods used in collecting, processing, evaluating, and storing personnel records of all kinds. B Ad 112: problems and cases in special kinds of records keeping and records administration.

113 Real Estate (3)

Principles of urban real estate practice; leasing and property management, valuation, appraisal, financing, taxation, urban growth, urban renewal.

118 Introduction to Data Processing (3)

Basic principles and methods of data processing. Introduction to fundamentals, potentials, and problems of automatic data processing as a tool of management.

119 Data Processing Programming (3)

Basic principles and methods of computer programming. Introduction to computer programming concepts; form and character of instructions and programming schema for leading types of digital electronic computers. Prerequisite: B Ad 118 or permission of instructor.

120 Data Processing Systems (3)

Basic principles and methods of data systems analysis, design, and implementation. Emphasis on relationship between equipment systems and management information systems; development of data processing systems. Prerequisite: B Ad 118 or permission of instructor.

131 Business Finance (3)

Basic principles involved in the financing of business enterprises. Prerequisite: Acct 1-2.

132 International Business Finance (3)

Introduction to principles, practices, problems, and institutions of international finance. Emphasis on international financial markets, exchange rates, balance-of-payments restraints, and governmental policies. Prerequisite: Econ 1-2.

138 Investment and Portfolio Management (3)

Principles of security investments: analysis of specific security investments and security markets, industry studies, portfolio construction and management. Prerequisite: Acct 1-2, B Ad 131.

141 Basic Marketing Management (3)

Introduction to marketing and marketing management in relation to our total economy and business management, consumer and demand analysis, retailing, wholesaling, major marketing management problems and policies with emphasis on major decision areas and tools. Prerequisite: Econ 1-2.

142 Retail Marketing (3)

Retail marketing perspective; problems of location, financing, merchandising policy, advertising and sales promotion, operating policy. Trends in retailing. Prerequisite: B Ad 141.

143 Marketing Research (3)

Principles and practices of marketing research with particular emphasis on basic methods and techniques, sources and interpretation of data, and presentation of results. Prerequisite: B Ad 141.

- 158 Physical Distribution Management (3)**
Distribution from shipper's point of view: problems of plant location, inventory control, warehousing; traffic management emphasized, including private carriage. Prerequisite: Econ 1-2.
- 161 Commercial Law: Contracts, Sales, Agency, Bailments (3)**
- 162 Commercial Law: Negotiable Instruments, Property, Mortgages (3)**
- 171 Principles of Transportation (3)**
Impact of intercity transportation systems on society. Emphasis on modal differences in development, economic characteristics, and regulation. Prerequisite: Econ 1-2.
- 172 Public Utilities (3)**
Legal and economic meaning of public utility concept; development, services, economic characteristics, rate making, and regulation of utility industries, with emphasis on electric, gas, and telephone industries. Prerequisite: Econ 1-2.
- 173 Transportation Systems Management (3)**
Comparative study, from the standpoint of various carrier modes, of management problems common to all modes of domestic and international transportation. Prerequisite: Econ 1-2.
- 174 Urban Transportation (3)**
Problems of developing balanced transportation systems for urban areas—area needs, modal evaluation, cost effectiveness, finance, and marketing. Prerequisite: Econ 1-2 or equivalent.
- 175 Introduction to Foreign Trade (3)**
The physical movement of goods in international business; conditions essential for successful trading; development of a hypothetical export shipment, including examples of documentation required and discussion of procedural problems from a management point of view. Emphasis on ocean marine insurance and export traffic management policy. Prerequisite: Econ 1-2.
- 178 Management of International Business Operations (3)**
Analysis of overseas projects according to purpose and type of organization; case studies involving development and management of overseas marketing programs and other operations in different world areas. Prerequisite: B Ad 175 or permission of instructor.
- 181 Manufacturing Production (3)**
Basic principles and methods of manufacturing production. Manufacturing facilities, plant and equipment. Illustrations selected from various process and fabrication industries.
- 191 Business Reports and Analyses (3)**
Scores of management information, array and analysis of data, interpretation and presentation of findings.
- 196 Social and Legal Environment of Business (3)**
An examination of the responsibilities of business toward its physical, economic, and social environments. The role of governmental bodies and interest groups in establishing public policies which affect these responsibilities.

198 Case Problems in Management (3)

Principles and techniques of management illustrated by cases drawn from business and industry. Prerequisite: B Ad 102, 105, 131, 141.

208 Personnel Management and Industrial Relations (3)

Survey of personnel management practices and procedures, including labor-management relations.

209 Seminar: Personnel Management (3)

Discussion of industrial personnel and manpower management, and research in advanced problems.

212 Unionism and Collective Bargaining (3)

The American labor movement. Collective bargaining and the conduct of labor relations under collective bargaining agreements.

213 Current Issues in Unionism, Collective Bargaining, and Labor Relations (3)

Current problems and issues. Prerequisite: B Ad 212.

225 Seminar: Manufacturing Production (3)

Examination of production technology, including new manufacturing processes, materials, products, equipment, and facilities. Implications of emerging technology in managing the production function. Cases, lectures, and individual student research. Prerequisite: B Ad 181 or permission of instructor.

229 Administration of Research and Development (3)

Examination of technological, political, and economic factors affecting the R&D environment; operational aspects; management problems in military, governmental, and industrial organizations; project selection, resource allocation, personnel, planning and control, measurement and evaluation.

231 Financial Decision Making (3)

Functions and objectives of financial management, asset management, problems of internal financial analysis, rate-of-return analysis, financial forecasting, problems of capital demand and supply. Prerequisite: Acct 115 or equivalent.

232 Seminar: Capital Resource Management (3)

Problems of capital acquisition, costs, rationing, structure; dividend policy. Prerequisite: B Ad 231.

233 Seminar: International Business Finance (3)

Case development and analysis of problems in international business finance. Impact of the evolving international payments system on business.

237 Investment Analysis (3)

Analysis of specific security investments; common and preferred stocks; corporate, government, and revenue bonds; sources of information. Prerequisite: B Ad 131 or equivalent.

238 Seminar: Investment and Portfolio Management (3)

Research and analysis of investment problems, techniques of selection and management of various types of funds. Prerequisite: B Ad 237.

241 Advanced Marketing Management (3)

Marketing management problems and policies in major decision areas of product planning, channels of distribution, advertising, personal selling, sales promotion, pricing, and development of integrated marketing programs. Tools useful in decision making. Case analysis.

243 Seminar: Marketing Research (3)

Research as an aid to decision making and increased efficiency in marketing, marketing research process, critical appraisal of methods and results, applications of marketing research. Cases, selected readings, and research projects. Prerequisite: a course in basic statistics.

248 International Marketing (3)

Organization for international marketing, foreign demand analysis, product development and policies, marketing structure and trade channels, advertising and promotion problems and policies, pricing, credits and collections, and legal aspects. Emphasis on development of effective international marketing strategy.

255 Seminar: International Trade I (3)

Research, analysis, and discussion of public and private foreign trade institutions; principles and theories of international trade; role of foreign trade and investment on U.S. balance of payments; problems and changing patterns in U.S. trade in the Western Hemisphere. Guest speakers.

256 Seminar: International Trade II (3)

Research, analysis, and discussion of international problems arising from economic integration; emphasis on European Economic Community; U.S. trade with developing nations; East-West trade problems and potential; foreign trade policy of the United States. Guest speakers. Prerequisite: B Ad 255 or permission of instructor.

257 Operation of the Multinational Firm (3)

Analysis and discussion of problems in international business by use of the case method, including international market entry and expansion; operating policies, procedures, and problems of multinational companies; developing executives for international business. Prerequisite: advanced Master's degree standing.

261 Managerial Economics I (3)

Managerial applications of economic analysis. Applications of economic theory and statistics to business decisions involving demand, production, cost, profits, investments, and inventories. Prerequisite: Mgt 203, Econ 217, Stat 111 and 112; or equivalent; or permission of instructor.

262 Managerial Economics II (3)

Managerial applications of economic analysis. Use of economic theory and statistics in business forecasting; interpretation of economic trends and developments; analysis of governmental economic policies as they affect business. Prerequisite: Mgt 203, Econ 218, Stat 111 and 112; or equivalent; or permission of instructor.

279 Purchasing and Materials Management (3)

(Formerly B Ad 281 Purchasing Principles and Practices)

Industrial purchasing and materials management principles and practices. Organization and functions in materials management. Determination of requirements, source selection, buying practices, policies, and ethics.

280 Procurement and Contracting (3)

Overview of procurement and contracting; emphasis on Federal Government buying policies, practices, and procedures.

282 Government Contract Administration (3)

Surveillance over performance of contract. Rights and obligations; changes, suspension of work, default, termination for the convenience of the government, inspection, warranties, procedures for the settlement of controversies on government contracts.

283 Pricing and Negotiation (3)

Scope and objectives of negotiated procurement; participation and relationships of functional elements of the organization; preparation, conduct, and recording of negotiations; analysis of contract cost, price, profit, investment, and risk; cost principles; incentives; relationship of contract type to work requirements; techniques of negotiation. Prerequisite: B Ad 280 or permission of instructor.

285 Systems Procurement and Project Management (3)

Development and procurement of major systems. Project management and the impact of this technique on the procurement process. Procurement planning—from concept formulation through contract definition, development, and manufacture.

293 Business Research (3)

May be repeated for credit.

295 Business Decision Simulation (3) (Campus Course)

Managerial decision making in a diversified multinational firm. Students are organized into teams in a simulated competitive environment in which a complex situation is played out using computers. Prerequisite: advanced Master's or doctoral degree standing.

296 Seminar: Controllorship (3)

Advanced problems of financial management.

297 Case Studies in Business Administration (3)

Cases covering the whole range of business activity. Analysis of operational situations and policy issues. Developing and implementing solutions to managerial problems. Prerequisite: advanced Master's degree standing.

299 Thesis Seminar (3)

Examination of thesis standards, research philosophy and methodology.

300 Thesis Research (3)

Cartography*

Program Adviser: Hyman Orlin, Professorial Lecturer in Geodetic and Cartographic Science; Telephone: 946-3557

* Affiliated with the Department of Mathematics.

1-2 Introduction to Cartography (3-3)

The use of maps. History of mapping. Introduction to the fundamental concepts of topography, hydrography, and cartography. Characteristics and uses of different kinds of maps and charts, symbolization, representation of relief, geographic and grid coordinates, attributes of various projections, reliability. Making maps. Fundamental concepts of geodesy and geomorphology as applied to maps and charts, surveying methods, application to aerial photography, photo interpretation, map design, compilation and reproduction. Prerequisite or concurrent registration: Geog 51. Prerequisite to Cart 2: Cart 1.

103-4 Photo Interpretation (3-3)

Photo interpretation and its uses. History of photo interpretation. Fundamental concepts of image interpretation, topography, hydrology, vegetation, and man-features. Parameters affecting photo interpretation. Civil and military interpretation. Measurements, keys, and diagnostic techniques; reliability. Infrared and radar photo interpretation. Satellite photography. Prerequisite or concurrent registration: Geod 17. Prerequisite to Cart 104: Cart 103.

107 Geomorphology (3)

Development of geomorphic concepts; the earth's crust, weathering, climate, and denudation; stream, shore, wind, and ice processes; glaciation; physiographic regions. Prerequisite: Cart 2.

108 Climatology (3)

Introduction, causes for climate and weather, air mass movements, water mass movements, physical features of boundaries. Tropics, subtropics, humid and dry continentals, subarctics. Prerequisite: Cart 2 or permission of instructor.

111 Cartographic Techniques (3)

State-of-the art orientation in the techniques and procedures currently used in cartographic agencies, including field methods, evaluation of source maps, use of scribing and contact screens in color separation, shaded relief, map reproduction, and associated managerial practices. Prerequisite: Cart 2, Chem 12.

112 Advanced Cartography (3)

Automated cartography, including computer-assisted map compilation, statistical mapping, automated color separation, and revision systems. Aerospace cartography, including orbital navigation, lunar, and planetary charting. Prerequisite: Cart 111.

Chemistry

Chairman: C.R. Naeser, Professor of Chemistry; Corcoran 104, Telephone: 676-6120

3-4 Fundamentals of Physical Science for Nonscience Majors (3-3)
(Campus Course)

A year course: credit toward a degree at this University given on completion of Chem 4. Lecture (2 hours), laboratory (3 hours). Selected topics from chemistry, physics, astronomy, and geology are integrated to

introduce the nonscience major to the basic methods and achievements of physical science. Laboratory fee, \$11 a semester.

11-12 General Chemistry (4-4) (Campus Course)

A year course: credit toward a degree at this University given on completion of Chem 12. Lecture (3 hours), laboratory (3 hours), recitation (1 hour). Elementary course in general chemistry, including qualitative analysis. Prerequisite: one year of high school algebra. Laboratory fee, \$18 a semester.

Chinese Language and Literature*

Adviser: Chung-wen Shih, Associate Professor of Chinese; Suite 714, 2100 M Street.
Telephone: 676-7106

1-2 Beginning Mandarin Chinese, Level I (3-3) (Campus Course)

A year course: credit toward a degree at this University given on completion of Chin 2. Classroom (3 hours), laboratory (1 hour). Fundamentals of grammar and pronunciation with graded reading and practice in writing. Listening comprehension and oral practice in language laboratory. Laboratory fee, \$17.50 a semester.

3-4 Beginning Mandarin Chinese, Level II (3-3) (Campus Course)

A year course: credit toward a degree at this University given on completion of Chin 4. Classroom (3 hours), laboratory (1 hour). Continuation of grammar and spoken Chinese with more emphasis on the written language and reading. Aural training, oral practice in language laboratory. Prerequisite: Chin 2 or equivalent. Laboratory fee, \$17.50 a semester.

Economics

Chairman: Henry Solomon, Professor of Economics; C-617, Telephone: 676-6150

Departmental prerequisite: Econ 1-2 is prerequisite to all other courses in Economics.

1-2 Principles of Economics (3-3)

Lecture (2) hours, recitation (1 hour). Survey of the major economic principles, institutions, and problems in contemporary life. Econ 1 is prerequisite to Econ 2.

121 Money and Banking (3)

Nature of money, credit, commercial banking, and other financial institutions in the U.S. monetary system.

†179-80 U.S. Economic History (3-3)

Process of economic growth from Colonial times to the present. Development of various sectors in the economy—such as agriculture, transportation, manufacturing, and banking—and their interdependence. Econ 179: 1607-1865. Econ 180: 1865 to present.

* Administered by the School of Public and International Affairs.

† Interdepartmental course offered by departments of Economics and History.

217-18 Survey of Economics (3-3)

For graduate students in fields other than economics. Econ 217: price theory. Econ 218: income and employment theory. Not open to graduate students in economics.

220 Survey of Principles and Issues in Economics (3)

For students in the Master of Science in Administration degree program. Survey of economic theory and its application to contemporary economic problems.

***251 Economic Development (3)**

Theories and problems of economic growth; special attention to the underdeveloped countries.

Education

Chairman: H.G. Detwiler, Professor of Education; C-512, Telephone: 676-6940

Departmental prerequisite: a degree from an accredited institution is prerequisite to courses in Education numbered from 201 to 400.

108 Human Development, Learning, and Teaching (3)

Lecture (2 hours), conference (1 hour), field work (3 hours). Principles of effective teaching based on an understanding of human development and the nature of learning. Prerequisite: Psyc 22.

112 Educational Measurement (3)

Scope, needs, services to students, selection and construction of teacher-made tests, interpretation of tests for evidence purposes. Prerequisite: Educ 108 and 123.

113 Elementary School Art (3)

Lecture and laboratory (3 hours), field work as arranged. For undergraduates in the elementary school curriculum. Materials and methods. Prerequisite: Psyc 1 and 22. Material fee, \$5.

114 Elementary School Music (3)

Lecture (2 hours), field work (2 hours). For undergraduates in the elementary school curriculum. Materials and methods. Prerequisite: Psyc 1 and 22.

†115 Elementary School Teaching of Reading (3)

Introduction to methods, techniques, materials, and activities essential to a good elementary school reading program. Prerequisite: Educ 108 and 123, or teaching experience.

†116 Elementary School Social Studies (3)

Content, methods, materials, and activities essential in the elementary school curriculum. Prerequisite: Educ 108 and 123, or teaching experience.

* War College Program only.

† This course may not be taken by students who have completed or plan to enroll in Educ 111.

***117 Elementary School Science (3)**

Lecture (2 hours), field work (2 hours). Content, methods, materials, and activities essential in the elementary school curriculum. Prerequisite: Educ 108 and 123, or teaching experience.

***120 Elementary School Mathematics (3)**

Content, methods, materials, concepts of "new mathematics," and activities essential in the elementary school curriculum. Prerequisite: Educ 108 and 123, or teaching experience.

123 Society and the School (3)

Lecture (2 hours), conference (1 hour), field work (2 hours). Historical and social development of education at local, national, and international levels; cooperation of the school with other community agencies; functions of school personnel.

***128 Children's Literature (3)**

Lecture (2 hours), field work (2 hours). Newer books for children and the children's classics, contribution of literature to child development, children's original expressions.

136 Teaching English in Secondary Schools (3)

Lecture (2 hours), field work (2 hours). Prerequisite: Educ 108, 123, and 131, or adequate experience; 18 semester hours in English.

140 Teaching Mathematics in Secondary Schools (3)

Prerequisite: Educ 108, 123, and 131, or adequate experience; mathematics through calculus.

†205-6 The Curriculum (3-3)

For experienced teachers. Educ 205: curriculum foundations and issues, comparison of curriculum patterns. Educ 206: curriculum development in subject areas, group consideration of student problems.

†207 Curriculum Materials (3 to 6)

For experienced teachers. Construction of courses of study and classroom teaching aids, with direct application to students' situations.

†208 Human Development (3)

Contribution of various disciplines to an understanding of human development throughout the life span; emphasis on practical implications of relevant research.

209 Child Development (3)

Interdisciplinary approach to child development. Analysis, interpretation, and practical implications for instruction of research in disciplines contributing to a knowledge of child development.

210 Adolescent Development (3)

Interdisciplinary approach to adolescent growth and development. Analysis, interpretation, and practical implications for instruction of research in disciplines contributing to a knowledge of the adolescent.

* This course may not be taken by students who have completed or plan to enroll in Educ 111.

† Prerequisite: adequate professional preparation.

***212 Educational Measurement (3)**

Basic measurement techniques; construction, selection, administration, and interpretation of objective and essay-type examinations; statistical analysis of test results; laboratory use of test instruments.

213-14 History of Education (3-3)

Educ 213: European backgrounds of American education. Educ 214: evolution of the American school system.

***216 Education of Slow-learning Children (3)**

Identification, nature, and needs of slow-learning elementary and junior high school children. Emphasis on diagnosis and treatment of learning difficulties.

***217-18 Philosophy of Education (3-3)**

Educ 217: to help students formulate a personal philosophy of education. Educ 218: social foundations of education—forces that shape policies and offerings of the school.

***219 Elementary School Classroom Procedures (3)**

Current classroom practices; emphasis on planning, unit teaching, techniques in discipline; individual and group evaluation techniques, resources for learning, providing for individual differences.

***223-24 Reading Problems (3-3)**

Elementary and secondary school reading difficulties; classroom and clinical techniques in solving reading problems. Prerequisite: one or more years of recent teaching experience.

227 Basic Issues in Elementary Education (3)

Identification, definition, and analysis of some of the most important problems facing the contemporary American elementary school.

228 Instructional Areas in Elementary Education (3)

Objectives, organization, content, and teaching methods in language arts, arithmetic, social studies, science, arts and crafts, health and physical education.

***229 Administration of Elementary Education (3)**

For experienced teachers and administrators. Achieving instructional objectives, organizing and servicing teaching activities, coordinating school and community life.

***231 Secondary School Classroom Procedures (3)**

Current classroom practices: teacher-pupil planning, group procedures, initiatory and culminating activities, individual and group evaluation techniques, teaching aids, etc.; review of recent literature.

***241 Education of the Gifted (3)**

For classroom teachers. Nature and discovery of giftedness, provisions for the gifted in regular classes, experimental projects.

Prerequisite: adequate professional preparation.

***243 Human Relations in Education (3)**

(Formerly *Human Relations in the Classroom*)

Principles and practices in human relations between and among learner, teacher, other school personnel, and parents.

245 School and Community (3)

The school as an important member of a team of social agencies that builds the community.

***251 Foundations of Guidance and Personnel Services (3)**

Introductory survey: definitions, scope, principles, historical background, organization, services, emerging trends, and issues.

252 Organization and Administration of Guidance Services (3)

For guidance directors, supervisors, and experienced school counselors who hope to qualify for such positions. Prerequisite: a minimum of 15 semester hours of approved graduate work in measurement and guidance.

253 Analysis of the Individual for Purposes of Counseling (3)

Detailed study of individual analysis and appraisal techniques. Development of systematic case study. Prerequisite: Educ 112 or equivalent.

***254 The Middle School (3)**

Purposes, organization, core program, guidance, developing course of study, extra-classroom activities.

***257 Educational and Occupational Development (3)**

Theories of career development; structure of education, training, and work in the United States; sources, forms, collection, evaluation, and dissemination of educational-occupational information.

260 Secondary School Supervision (3)

For experienced teachers and administrators with two or more years of teaching experience. Review of modern supervisory concepts, including practices followed in the operation of the school.

263 Human Resource Development: Training and Education (3)

(Formerly *Employee Development*)

Concepts and purpose, historical backgrounds, emerging roles of human resource development personnel, program areas. Prerequisite: adequate professional preparation or two years of experience in training, education and development.

264 Program Planning in Human Resource Development (3)

(Formerly *Employee Development*)

Training, education, and development programs for employees and non-employees. Field work with actual client system. Admission by permission of instructor.

- *271 The Teacher and School Administration (3)**
Role of federal, state, and local administrative units; school finance; legal controls; school plant; public support; improving teaching conditions.
- *272 The Teacher and School Supervision (3)**
Nature, organization, human relationships, and techniques.
- *275 Seminar: School Finance (3)**
Educational financial theory, practice, and control, including methods of financing.
- *276 Seminar: Public Relations in School Administration (3)**
Purposes, gathering materials, disseminating agencies, publicity media, public participation in policy making.
- *278 School Law (3)**
Sources and scope of school law; legal rights and responsibilities of teachers, pupils, and taxpayers. Other legal problems of major interest to the group.
- *279-80 Adult Education (3-3)**
Educ 279: current concepts and objectives, agencies involved, programs on all levels—international through community. Educ 280: the adult as a learner, the teacher of adults, learning-teaching activities, administration of adult education programs.
- *283 Higher Education in the United States (3)**
Development, scope, purposes, present status, programs and trends in higher education in the United States.
- *284 Administration of Higher Education (3)**
Government, organization, and administration of colleges and universities.
- 291 Planning the School Plant (3)**
Selection of sites; evaluation of existing buildings; utilization of present facilities; adaptation to curricular needs; building, operation, and maintenance problems.
- *295 Research Methods and Procedures (3)**
Required of all candidates for graduate degrees in Education. To be taken early in the graduate program. Prerequisite: elementary course in statistics.
- 352 Advanced Career Development (3)**
Advanced workshop for experienced counselors; theory and uses of new educational media in guidance; field study of job opportunities in area of business, industry, and government agencies. Admission by permission of instructor.
- 355 Counseling in Groups (3)**
For experienced counselors and psychologists. Peer-group relationships with emphasis on adolescent groups. Principles of group dynamics as related to interaction within groups. Techniques and practice in group counseling.
- * Prerequisite: adequate professional preparation.

356 Seminar: Guidance and the Disciplines (3)

For experienced counselors. Exploring the foundations of guidance through the disciplines of psychology, sociology, economics, anthropology, and philosophy.

373 The Junior-Community College (3)

Development, organization, curriculum, role, issues, and problems of the junior-community college.

374 Current Issues in Higher Education (3)

Investigation of current issues in higher education.

381 The Adult as a Learner (3)

Psychology of learning as applied to adults; effect of age on learning; physical and social environment in adult education situations.

382 Methods in Adult Education (3)

Methods, techniques, and devices in adult education; traditional methods, developing action-oriented learning situations, programmed instruction, and systems approach in developing training materials.

English

Chairman: G.E. McCandlish, Associate Professor of English; Stuart 410, Telephone: 676-6180

Before students are registered in Engl 1, they are tested in the minimum essentials of vocabulary, spelling, grammar, standard usage, and writing skill. Those students who show marked superiority may, upon passing further tests, be exempted from one or both halves of the English Composition course; those who are inadequately prepared for Engl 1 will be assigned to *Basic English*. In lieu of *Basic English*, off-campus students may, if they desire, be given permission to register for Engl 1x on campus. Engl 1 or 1x is prerequisite to all other courses in English.

ENGLISH COMPOSITION

X Basic English (0)

Instruction, drill, and exercises in grammar, vocabulary, spelling, and mechanics in general; instruction and exercises in composition and reading. This course is designed to prepare students for Engl 1. No academic credit. Tuition fee, \$100.

1 English Composition (3)

Analysis and practice of expository techniques with emphasis on unity, development, organization, coherence; library research procedure.

1x English Composition (3) (Campus Course)

Intensive course in English grammar and composition for students inadequately prepared for Engl 1. Begins with detailed instruction, drill, and exercises in basic structure of the English language and in writing paragraphs; continues with content of Engl 1. Engl 1x meets five hours a week and carries 3 semester hours of credit. Total fee, \$229 (tuition fee of \$204 plus additional fee of \$25).

2 English Composition (3)

Readings and practice in expository and argumentative techniques and in research procedure. Prerequisite: Engl 1 or 1x.

11 The Writing of Reports (3)

Theory and practice in the writing of technical reports. Prerequisite: Engl 1 or 1x and 2.

WORLD LITERATURE

41-42 Introduction to World Literature (3-3)

Engl 41: a survey of Western literary heritage from Homer to Milton.
Engl 42: a review of Western literature from the English metaphysical poets to the present.

ENGLISH LITERATURE

51-52 Introduction to English Literature (3-3)

Historical survey. Prerequisite: Engl 1 or 1x.

91-92 Introduction to European Literature (3-3)

Consideration of various types. Prerequisite: Engl 1 or 1x.

AMERICAN LITERATURE

71-72 Introduction to American Literature (3-3)

Historical survey. Engl 71: from the beginnings to the Civil War. Engl 72: from the Civil War to present. Prerequisite: Engl 1 or 1x.

Epidemiology and Environmental Health

Chairman: J.W. Millar, Vivian Gill Professor of Epidemiology and Environmental Health; School of Medicine, Telephone: 331-6117.

1 Principles of Environmental Health I (2)

Communicable disease: recognition, mode of spread, general methods of control, immunization, quarantine, disinfectants, and insecticides.

2 Principles of Environmental Health II (2)

Water, its relationship to man's well-being. Disposal of human wastes—excreta and refuse; atmospheric pollution.

3 Principles of Environmental Health III (2)

Food, housing (urban and rural), institutional sanitation, radiological sanitation, insect vector, and rodent control.

101 Environmental Sanitary Science I (2)

Water: general characteristics (urban and rural), treatment and distribution; public bathing place sanitation; design and function of water treatment facilities.

- 102 **Environmental Sanitary Science II (2)**
Recognition and control of environmental pollution. Treatment and disposal of human wastes—excreta, refuse, and air.
- 103 **Environmental Sanitary Science III (2)**
Dairy products and food sanitation; processing, storage, and distribution of food. Supervision and training of personnel involved with food and the food industry.
- 104 **Environmental Sanitary Science IV (2)**
Housing, urban and institutional; heating, ventilation, lighting, and noise. Study of federal and municipal regulatory aspects.
- 121 **Environmental Biostatistics (2)**
Statistical reasoning, collection of data, rates, incidence, and prevalence. Generalization of observations and use of measurement data.
- 122 **Environmental Epidemiology I (2)**
Infectious diseases: bacterial, viral, rickettsial, protozoal, and helminthic.
- 123 **Environmental Epidemiology II (2)**
Zoonoses, deficiency diseases, chronic disease, pneumoconiosis, mental health, maternal and child health.
- 131 **Environmental Epidemiology III (1)**
Venereal disease: etiology, clinical manifestation's diagnosis; prevention and control of syphilis, gonorrhea, chancroid, granuloma, iniquinale, and LGV.
- 141 **Public Health Entomology I (2)**
How the arthropods affect man. Study of host-parasite vector relationships; principles of systematic biology and basic insect taxonomy and toxicology.
- 142 **Public Health Entomology II (2)**
Identification, life cycles, and bionomics of medically important insects and other arthropods.
- 143 **Public Health Entomology III (1)**
Study of chemical, biological, and mechanical control of all medically important arthropods.
- 144 **Public Health Entomology IV (1)**
Prevention and control of rodent infestation; identification, habits, and relationship to man.
- 151 **Public Health Microbiology I (3)**
Medical parasitology, protozoology (intestinal), the Haemosporidia (malaria), the Haemoflagellates and the metozoa (helminths) of medical importance.
- 152 **Public Health Microbiology II (2)**
Clinical bacteriology, characteristics and identification of the bacteria involved in disease, study of rickettsia and viruses.

153 Public Health Microbiology III (2)

Study and identification of the flora of water, dairy products, food, and the atmosphere.

154 Public Health Microbiology IV (1)

Mycology: study of medically important fungi, systematic mycoses and dermatomycoses.

171 Industrial Hygiene I (2)

Chemical hazards: study of diseases from chemical exposure, toxic dusts, metal fumes and vapors, gases, and organic compounds.

172 Industrial Hygiene II (2)

Physical hazards: biological effects of low and high temperatures, radiation (electromagnetic, ultraviolet, ionizing), illumination, sound, pressure, and atmospheric pollution.

191 Public Health Administration I (1)

Activities and organization; philosophy, background, and development. Public health activities include vital statistics, laboratory services, education, nursing, and social services.

192 Public Health Administration II (1)

Administrative considerations, including governmental aspects, legal considerations, fiscal management, personnel factors, and public relations in public health organizations.

French*

Chairman: J.F. Burks, Associate Professor of French; A-11, Telephone: 676-6330

1-2 First-year French (3-3)

A year course: credit toward a degree at this University given on completion of Fren 2. For beginners. Pronunciation, conversation, grammar, composition, reading of modern French prose.

3-4 Second-year French (3-3)

A year course: credit toward a degree at this University given on completion of Fren 4. Conversation, grammar, composition, reading in modern French prose, introduction to French civilization. Prerequisite: Fren 1-2, or two years of high school French.

51-52 Survey of French Literature (3-3)

Readings in French literature from the Middle Ages to the present. Lectures, readings, recitations, and informal discussions.

* Administered by the Department of Romance Languages and Literatures.

Geodesy*

Program Adviser: Hyman Orlin, Professorial Lecturer in Geodetic and Cartographic Science; Telephone: 946-3557

12 Plane Surveying (3)

Theory and practice in measurement of distances, angles, and elevations; traversing, leveling, and triangulation; stadia surveying, plane coordinate computations, and miscellaneous surveying problems. Prerequisite: Math 6 or equivalent.

13 Geodetic Surveying (3)

Elements of geodetic and hydrographic surveys; electronic measurements, triangulation, trilateration, and precise traverses; geodetic leveling and precise trigonometric leveling; introduction to geodetic astronomy and to least squares adjustment. Prerequisite: Geod 12, Math 31.

17 Elementary Photogrammetry (3)

Fundamentals of aerial photography, photogrammetric optics, and photographic processes; mathematics of vertical and tilted photographs; stereoscopy and parallax; planning and executing the photogrammetric project; radial triangulation methods; photomaps; oblique and terrestrial photography. Prerequisite: Cart 2, Geod 12.

18 Intermediate Photogrammetry (3)

Basic photogrammetry theory and practice. Stereoscopic plotting instruments; graphical and computational methods for adjusting strips of aerial triangulation; electronic computers. Method of least squares applied to photogrammetry. Prerequisite: Geod 17, Math 31.

110 Map Projections (3)

Mathematics of projections; geometry of sphere and ellipsoid; distortions; conic, cylindrical, and azimuthal projections; geodetic projections. Prerequisite: Math 33 or former 23.

117 Advanced Photogrammetry (3)

Analytic photogrammetry. Prerequisite: Geod 18, Math 24 or 33.

155 Elementary Geodesy (3)

Principles and formulas basic to theoretical and applied geodesy, with application to special problems; computations on an ellipsoid, gravimetry, deflection of the vertical and Laplace's equation, introduction to satellite geodesy. Prerequisite: Geod 13, Math 32.

156 Geodetic Astronomy (3)

Principles and formulas for the astronomic determination of longitude, time, azimuth, and latitude; star catalogues; observing and time recording instruments; practice in observing and computation. Prerequisite: Geod 13, Math 32.

160 Mathematics of Adjustments and Least Squares (3)

Types and distribution of errors, Gaussian and Poisson distributions, fundamentals of matrix algebra with special emphasis on least squares adjustment of geodetic networks. Prerequisite: Geod 155; Math 24 or 33, or Stat 107.

* Affiliated with the Department of Mathematics.

161 Adjustments in Geodesy and Photogrammetry (3)

Advanced adjustment theory. Prerequisite: Geod 160.

Geography and Regional Science

Chairman: Marvin Gordon, Associate Professor of Geography and Regional Science;
I-200, Telephone: 676-6185

51 Introduction to Geography (3)

Interrelated processes affecting the character of landforms, hydrography, soils, vegetation, and climate; relevance of their world patterns to man.

52 World Regional Patterns (3)

(Formerly World Regions)

Emphasis on spatial aspects of man's activities within a world regional framework.

125 Transportation Geography (3)

Problems of interaction, diffusion, and information transfer as they appear in a spatial context.

126 World Economic Geography (3)

World patterns and processes underlying the areal structure of selected economic activities.

127 World Population and Settlement (3)

Patterns of world population; factors contributing to population pressures, growth, and migrations.

141 Urban Settlement (3)

Location, functions, and forms of cities; urban-rural relationships; urban problems and the history of their development.

146 World Political Geography (3)

Analysis of the interrelationships between the political community and the human and physical environment.

148 Principles of Geography (3)

Study of geographic principles, technology and tools designed to meet specific needs of teachers. Emphasis on the practical application of geographic concepts and the use of source materials in the classroom.

149 Principles of Photographic Interpretation (3)

Fundamentals of aerial photographic interpretation, survey of the applications of imagery application, introduction to nonoptical image forming systems.

152 Eastern Europe (3)**161 Latin America (3)****165 Asia (3)**

168 Arctic Regions (3)

Human and physical aspects of the Arctic regions with respect to natural environment and potential resources, present state of development and special problems encountered. Given in cooperation with the Arctic Institute of North America.

Geology

Chairman: Geza Teleki, Professor of Geology; Bell 3, Telephone: 676-6190

1-2 Introductory Geology (3-3) (Campus Course)

Lecture (2 hours), laboratory (2 hours), optional field trips. Survey covering the principles of geology. Laboratory fee, \$10 a semester.

3 Introductory Geology (3)

Survey covering the principles of geology. Nonlaboratory course for off-campus students only.

4 Introductory Geology (3)

Geological periods, evolution of life on earth. Nonlaboratory course for off-campus students only. Prerequisite: Geol 1 or 3, or permission of instructor.

125 Marine Geology (3)

Lecture and map work. Principles of oceanography and submarine geology; geology of the deep sea; topography, crustal structure, sedimentary processes, and marine environment. Prerequisite for geology majors: Geol 1-2; for students in fields other than geology, permission of instructor.

141 Introductory Geochemistry (3) (Campus Course)

Lecture (2 hours), laboratory as arranged. Principles and theories on the abundance, relationships, and distribution of the elements in various rock and mineral species. Prerequisite: Geol 114 and 115 or equivalent; Chem 11-12; Math 30 or former 21; Phys 1, 2. Laboratory fee, \$12.

Geophysics*

Program Adviser: Hyman Orlin, Professorial Lecturer in Geodetic and Cartographic Science; Telephone: 946-3557

105 Elementary Geophysics (3)

Introduction to geophysics; origin of the earth, geochronology, seismology, gravity, and geomagnetism. Prerequisite: Geol 1 or 3, Math 32.

106 Interpretation Theory—Geophysics (3)

Development of mathematical and physical foundations for interpreting seismic, gravimetric, and magnetic data. Prerequisite: Geop 105, Math 24 or 33.

* Affiliated with the Department of Mathematics.

115 Elementary Seismology (3)

Principles of seismographs; analysis of stress and strain, interpretation of earthquake seismograms, location of earthquakes; seismic waves in the earth and the structure of the earth's interior as deduced from geophysical data, earthquake magnitude energy and intensity, seismic risk and the effects of earthquakes, review of earthquake activity throughout the world. Prerequisite: Geop 105.

Germanic Languages and Literatures

Chairman: Carl Steiner, Associate Professor of German; Rice 408, Telephone 676-6195

1-2 First-year German (3-3)

A year course: credit toward a degree at this University given on completion of Germ 2. Essentials of German grammar; translation of easy prose.

3-4 Second-year German (3-3)

A year course: credit toward a degree at this University given on completion of Germ 4. Selections from modern German prose; continuation and review of grammar. Prerequisite: Germ 1-2 or two years of high school German.

9-10 German Conversation and Composition (3-3)**51-52 Introduction to German Literature (3-3)**

Health Care Administration

Chairman: Leon Gintzig, Professor of Hospital Administration; CC-11, Telephone: 676-6220

153-54 Survey of Health Care Organization and Procedures (3-3)

Primarily for students who wish an over-all knowledge of organization and procedures used in health care policies, hospitals, and long-term care facilities. Not open to Master's candidates in Health Care Administration.

202 Introduction to Health Care Administration (3)

Lecture and discussion (2 hours), laboratory (2 hours). Survey of state, national, and community health services; includes medical terminology, communicable diseases, environmental sanitation, and biostatistics.

203 Organization and Management (3)

Lecture and discussion (2 hours), laboratory (2 hours). History and current character of institutional health care. Organizational functions and structure of various kinds of facilities related to health care administration. Prerequisite or concurrent registration: Mgt 201.

205 Hospital Management Procedures (3)

Lecture and discussion (2 hours) laboratory (2 hours). Departmental administration. Survey of hospital law; hospital forms, procedures, and

systems; and hospital programs pertaining to disaster relief, safety, fire prevention.

209 Health Care Economics and Financial Management (3)

Lecture (2 hours), laboratory (2 hours). Economic and financial analysis of the interactions between consumers of health care, providers of health care, and public and private prepayment and insurance programs. Industry price structure and the long- and short-term capital requirements of health care institutions.

250 Administration for Mental Care (3)

Special characteristics of administration required in mental hospitals, psychiatric sections of general hospitals, mental health clinics, and others.

History

Chairman: R.P. Sharkey, Professor of Economic History; Stuart 416, Telephone: 676-6230

Departmental prerequisite: Hist 39-40 or 91-92 is prerequisite to courses 108 through 158 and 187 through 196; Hist 71-72, to courses 167 through 185; either Hist 39-40, 71-72, or 91-92, to courses 162 through 166. Prerequisite to Hist 105-6 is either Hist 39-40, 91-92, or a background in a science. Students may waive one or more of the prerequisite courses by passing a departmental waiver examination, by attaining scores of 600 or above on the College Entrance Examination Board Achievement tests, or by good performance on Advanced Placement Examinations.

39-40 European Civilization in Its World Context (3-3)

Primarily for freshmen. Hist 39: political, social, economic, and cultural history from ancient times to early modern era. Hist 40: from early modern era to present. Students cannot receive credit for both Hist 39-40 and 91-92.

71-72 Introduction to American History (3-3)

Primarily for sophomores. Hist 71: political, social, economic, and cultural forces of the United States in their world setting from 1492 to 1861. Hist 72: from 1861 to present.

91-92 World Civilizations (3-3)

Hist 91: major civilizations of the world to 1500. Hist 92: European and world civilization since 1500. Students cannot receive credit for both Hist 39-40 and 91-92.

145-46 History of Russia (3-3)

Rise and revolution of Russia. Hist 145: the Old Regime, 800-1900. Hist 146: Revolution and Soviet rule, since 1900.

149-50 European Diplomatic History (3-3)

The European state system; diplomatic practices and relations since the Congress of Vienna; emphasis on policies and actions of the great powers and their statesmen. Hist 149: to 1890. Hist 150: since 1890. Students cannot receive credit for both Hist 150 and 157.

163-64 History of Latin America (3-3)

Political, social, and cultural development. Hist 163: through independence. Hist 164: the national period.

***179-80 U.S. Economic History (3-3)**

Process of economic growth from Colonial times to the present. Development of various sectors in the economy—such as agriculture, transportation, manufacturing, and banking—and their interdependence. Hist 179: 1607-1865. Hist 180: 1865 to present.

181-82 U.S. Diplomatic History (3-3)

Tendencies toward isolation, expansion, and collectivism; disputes with foreign countries and their settlement; activities of American secretaries of state and diplomatic agents. Hist 181: to 1898. Hist 182: since 1898.

195-96 History of East Asia (3-3)

Civilizations of China and Japan; emphasis on cultural development and social organization. Hist 195: beginnings to about 1800. Hist 196: traditional societies on the eve of the modern era, their responses to Western cultural influences since the mid-19th century.

245-46 Research Seminar: Russian History (3-3)

Prerequisite: Hist 145-46 or equivalent.

281-82 Research Seminar: U.S. Diplomatic History (3-3)

Prerequisite: Hist 181-82 or equivalent.

Humanities

Faculty Adviser: J.H. Coberly, Professor of English; Stuart 405, Telephone: 676-6630

1-2 Humanities in the Modern World (3-3)

Interdisciplinary study of modern Western thought from the Renaissance to the 20th century. Reading and intensive class discussion of five works each semester from the following authors: Machiavelli, Pope, Voltaire, Rousseau, Goethe, Tolstoy, J.S. Mill, Zola, Nietzsche, Kierkegaard, Freud, Kafka, Koestler, T.S. Eliot. Background lectures on the major intellectual, artistic, economic, and social movements.

3-4 Classical Humanities (3-3)

Interdisciplinary study of the thought of Greece and Rome. Reading and intensive class discussion of five works each semester from the following authors: Homer, Hesiod, Aristophanes, Plato, Aristotle, Aeschylus, Euripides, Sophocles, Herodotus, Thucydides, Lucretius, Marcus Aurelius, Epictetus, Polybius, St. Augustine. Background lectures on the major intellectual, artistic, economic, and social movements.

*Interdepartmental course offered by departments of History and Economics.

International Affairs*

Faculty Adviser: B.M. Sapin, Professor of International Affairs and Political Science;
Building T, Telephone: 676-6240

The following courses are offered only in the War Colleges' curricula:

- 250 International Relations of Latin America (3)
- 256 Diplomacy Between the World Wars (3)
- 257 Seminar: Diplomatic History of World War II (3)
- 259 Seminar: International Relations of Western Europe (3)
- 260 Fundamentals of National Power (3)
- 261 International and U.S. Foreign Policy (3)
- 262 National Security Policy of the United States (3)
- 263 Intercultural Relations (3)
- 265 Seminar: Diplomacy, Strategy, and Arms Control (3)
- 267 Seminar: Domestic Bases of Foreign Policy Formulation (3)
- 270 Current Economic Problems (3)
- 287 Power Politics in the Pacific (3)
- 288 Seminar: the United States and the Caribbean (3)
- 289 Seminar: Modern China (3)
- 297 Readings in International Affairs (1, 2, or 3)
- 299-300 Thesis Research (3-3)

Italian†

Chairman: J.F. Burks, Associate Professor of French; A-11, Telephone: 676-6330

1-2 First-year Italian (3-3)

A year course: credit toward a degree at this University given on completion of Ital 2. For beginners. Pronunciation, conversation, grammar, composition, reading of modern Italian prose.

3-4 Second-year Italian (3-3)

A year course: credit toward a degree at this University given on completion of Ital 4. Conversation, grammar, composition, reading in modern Italian prose, introduction to Italian civilization. Prerequisite: Ital 1-2 or two years of high school Italian.

* Administered by the School of Public and International Affairs.

† Administered by the Department of Romance Languages and Literatures.

51-52 Introduction to Italian Literature (3-3)

Prerequisite: Ital 4 or equivalent.

Journalism

Chairman: R.C. Willson, Associate Professor of Journalism; Stuart 300, Telephone: 676-6225

146 Government Information (3)

Growth of information activities in government and the role of the information specialist. Writing and editing for government information operations.

Latin American Civilization—Special Program

Program Director: R.C. Burns; Building E, Telephone: 676-7049

Faculty Consultants: C.E. Galbreath, Professor of International Economics; Marvin Gordon, Associate Professor of Geography and Regional Science; J.W. Robb, Professor of Romance Languages; Mario Rodríguez, Professor of Latin American History; K.L. Storrs, Instructor in Political Science; H.M. Stout, Professor of International Affairs and Political Science

101 Latin American Civilization (3)

A three-week, University-conducted study program in a selected area in Latin America, effecting a broad synthesis of history, politics, economy, geography, language, and literature in order to achieve an understanding of contemporary problems and assess national attitudes in the light of world relations. On-the-spot seminars, guest lectures at universities, instructional visits to government offices, first-hand observation of each country and the operation of its economy, comparisons and contrasts among the countries of the area. May be repeated for credit.

Management Science

Chairman: R.L. Holland, Associate Professor of Management Science; Hall of Government, Telephone: 676-7375

201 Advanced Administrative Management (3)

Advanced course in administration emphasizing principles and practices common to administrative units of all kinds.

203 Mathematics for Management (3)

Mathematical concepts employed in the solution of management problems. Applications of analytical geometry, functions, elements of calculus, and linear algebra to optimization problems. Prerequisite: algebra.

204 Quantitative Factors in Administration (3)

Survey of quantitative techniques used in the solution of management problems. Potentials and limitations of mathematical models and proper areas for their application. Topics include probability, statistical decision theory, linear programming, waiting line, inventory replacement models.

207 Human Behavior in Organizations (3)

Individual, group, intergroup, and other human behavior and development; application of social science research to administration. Practical applications emphasized.

211 Executive Leadership and Development (3)

(Formerly Leadership and Executive Performance)

Theories of managerial leadership; issues and problems associated with leadership in large organizations and at higher management levels; executive selection and development. Prerequisite: Mgt 201 or permission of instructor.

218 Survey of Data Processing (3)

Fundamentals of automatic data processing; manual, punched card, and electronic data processing principles and procedures; basic machine language and advanced language programming techniques; phases of data systems development; role of the manager in management information systems. Emphasis on proper use of data processing as another tool of management.

219 Digital Computer Programming Concepts (3)

Programming concepts, techniques, and practices; FORTRAN and COBOL; address modifications, indexing, sub-routines, sub-programs, table look-up, machine functions, data representation, instruction formatting, and programming systems; government- and business-oriented problems. Students will not become programmers, but will understand the use of programming in management information systems. Prerequisite: Mgt 218 or permission of instructor.

220 Comparative Digital Computer Systems and Their Management (3)

Characteristics and capacities of the range of data processing equipment in use today, special purpose equipment in business and government, recent and prospective equipment developments. Fundamentals of data processing installation design and management. Prerequisite: Mgt 218 or 219, or permission of instructor.

221 Management Information Systems Development and Application (3)

Development of management information systems, integration of data processing in operations of government or business, impact on management organization and decision making. Case studies. Prerequisite: Mgt 218 or 219, or 224; or permission of instructor.

223 Management of a Data Processing Organization (3)

Organization and management of data processing function in business and government; study of types of resources required: planning, scheduling, and production of data processing workloads; performance standards; evaluation criteria. Prerequisite: Mgt 218 and either 219 or 220; or permission of instructor.

224 Theory and Management of Systems (3)

Advanced course in systems, emphasizing systems theory and the capacities, capabilities, and management of current, large systems. Analysis of components and elements of systems and their association with management concepts. Applications; various techniques and potential problems for implementation. Systems of the future are projected with consideration of quantitative and technological developments. Particular emphasis on computer-based and communications-oriented systems. Prerequisite: Mgt 201, 218.

225 Introduction to Managerial Statistics (3)

Introduction to the mathematics of probability and statistics and its applications in management science and operations research. Topics include random variables, discrete and continuous probability distributions; moments and other descriptive measures; sampling theory; and an introduction to statistical estimation, hypothesis testing, and regression analysis. Prerequisite: Mgt 203 or equivalent.

226 Managerial Statistics (3)

Management applications of the theory and techniques of mathematical statistics. Topics include maximum likelihood and other methods of estimation, hypothesis testing, descriptive measures of bivariate distributions, regression and correlation, analysis of time series, econometric models and multiple regression, statistical decision theory, and the revision of probabilities in decision making. Prerequisite: Mgt 225.

227 Mathematical Programming: Techniques and Applications (3)

Technical and management considerations of linear and nonlinear programming. Mathematical and computational aspects of linear programming. Formulation of linear programming models. Studies of applications of linear programming. Introduction to theory and application of nonlinear programming. Prerequisite: Mgt 203 or equivalent.

228 Systems Analysis by Simulation (3)

Methods of systems analysis via computer simulation. Particular attention to inventory models, although queueing systems and management planning models are also covered. Prerequisite: Mgt 225, 226.

229 Seminar: Management Science and Operations Research (3)

Supervised study in depth and advanced projects in management science and operations research. Prerequisite: Mgt 225, 226, 227; or permission of instructor.

263 Organization and Management (3)

Contemporary management theory; emphasis on application of management concepts in organizational practice. Comparative studies of current organizational designs and management processes. Prerequisite: Mgt 201, 204, 207.

268 Management Engineering (3)

Analysis of the techniques for initiation and implementation of management engineering programs; emphasis on organization and methods surveys, including the study of work measurement, work simplification, management audits, and other management improvement programs.

***280-81 Managerial Aspects of National Security (3 or 4-3 or 4-3)**
-82

The application of business management principles to the military aspects of national security; organization and administration of the Federal Government for national defense; management of national resources (natural, human, energy, economic); budgeting and controllership; determination of requirements; procurement; production; supply management; and communications.

287 Relations of Government to Business (3)

Activities of government in relation to business management in areas of labor relations, wages, production, and prices. Trend and change in economic activity and its bearing upon government policy.

295 Research Methods (3)

Research techniques, sources of information, array and analysis of data, interpretation and presentation of the findings.

Mathematics

Chairman: Hewitt Kenyon, Professor of Mathematics; Monroe 422, Telephone: 676-6235

No Mathematics courses numbered 1 to 100 are available for college credit if the student's previous training in mathematics meets the prerequisite for a higher numbered course.

Graduate credit may not be given for Mathematics courses numbered from 101 to 200 without the permission of the Chairman of the Department.

Placement Examination: new students registering for Math 30 are required, prior to registration, to take a placement examination in algebra and trigonometry.

Departmental prerequisite: Math 24 or 33 is prerequisite to courses in Mathematics from 101 to 200. Exception to this regulation may be made for Math 101, 122, and 124. Students anticipating a substantial concentration in mathematics should consult with the Department about early completion of these courses.

3 College Algebra (3)

Equivalent to second-year high school algebra. Prerequisite: one year each of high school algebra and high school geometry.

6 Plane Trigonometry (3)

Prerequisite: two years of high school algebra and one year of high school geometry, or Math 3 (or concurrent registration therefor).

9 General Mathematics I (3)

For students electing Math 9 and 10 as a terminal sequence. Logic, sets, number systems. Prerequisite: two years of high school mathematics.

10 General Mathematics II (3)

Statistics and probability, exponents and logarithms, trigonometry. Prerequisite: Math 9.

* Available only to students in the Master of Science in Administration program at the Industrial College of the Armed Forces.

15 Finite Mathematics I (3)

Introduction to logic, sets, and probability. Prerequisite: two years of high school mathematics.

16 Finite Mathematics II (3)

Vectors and matrices, mathematics of finance and accounting, linear programming, introduction to game theory. Prerequisite: Math 15.

24 Calculus IV (3)

Solid geometry, multiple integration and partial differentiation with applications, line and surface integrals, differential equations. Prerequisite: former Math 23.

30 Precalculus (3)

Logic, set theory, real number system, inequalities, basic analytic geometry, functions and relations. Polynomial, trigonometric, logarithmic, and exponential functions. Prerequisite: Math 3 and 6; or one and one-half years of high school algebra, one year of high school geometry, and one-half year of high school trigonometry; or equivalent.

31 Calculus of One Variable (3)

Differentiation and integration of algebraic and elementary transcendental functions, with simple applications. Prerequisite: Math 30 or equivalent.*

32 Calculus of Several Variables (3)

Partial derivatives, multiple integrals, infinite series. Prerequisite: Math 31.

33 Calculus of Vector Functions (3)

Elementary linear algebra, vectors, and matrices. Vector calculus, implicit function theory. Prerequisite: Math 32.

34 Introduction to Linear Algebra (3)

Linear functions, solutions of equations, dimension and rank, determinants, eigenvalues, quadratic forms, change of basis. Prerequisite: Math 31 or permission of instructor.

111 Mathematics for Engineers and Physicists I (3)

Differential equations, linear algebra.

112 Mathematics for Engineers and Physicists II (3)

Fourier series, Laplace transformation, partial differential equations. Prerequisite: Math 111.

124 Introduction to Matrix Theory (3)

Elementary theory of finite spaces, determinants, equivalence, matrices with polynomial elements, similarity of matrices.

134 Introduction to Boundary Value Problems (3)

Prerequisite: Math 111 or 142.

*Math 30 may be waived as a prerequisite requirement by examination on scheduled dates.

139 Advanced Calculus I (3)

Review and extension of elementary one-variable calculus, emphasis on the theoretical foundations.

140 Advanced Calculus II (3)

Calculus of several variables. Prerequisite: Math 139 or equivalent.

153 Introduction to Numerical Analysis (3)

Introduction to fundamentals of numerical analysis using modern digital computers. Solution of linear systems and of ordinary differential equations. Interpolation polynomials, iterative solution of nonlinear equations, simple quadrature techniques. Prerequisite: Math 111 or 139; or equivalent.

171 Vector Analysis (3)

Music

Chairman: George Steiner, Associate Professor of Music; FF-10, Telephone: 676-6245

3 Introduction to Musical Understanding (3)

Introductory history of musical styles, related to listening; elements and materials of music.

4 Survey of Music Literature (3)

Introductory study of musical forms, structures, and textures; aural analysis of selected literature.

Oceanography*

Program Adviser: Hyman Orlin, Professorial Lecturer in Geodetic and Cartographic Science; Telephone: 946-3557

11 Navigation (3)

Theory of navigation, charts, navigation aids, celestial navigation, ship-board instruments.

101-2 Elementary Oceanography (3-3)

Chemical and physical properties and composition of sea water, heat budget, distribution of variables, statics, dynamics, water masses, general circulation of the oceans, underwater sound, propagation of light, submarine topography, sea floor deposits, biological classifications, and marine ecology. Spectrum of ocean waves from capillary through tidal, including internal waves. Observations and reduction; history and interrelationships between marine sciences. Prerequisite to Ocea 101: Phys 1. Prerequisite to Ocea 102: Geol 1 or 3.

* Affiliated with the Department of Mathematics.

110 Ocean Dynamics (3)

All aspects of physical oceanography except waves and tides. Subjects of physical and chemical properties of sea water, underwater sound, and propagation of light. Emphasis on hydrodynamic equations, statics and kinematics, currents, heat budget, turbulence, and the general circulation and water masses of oceans. Prerequisite: Math 32, Ocea 101.

111 Ocean Waves and Tides (3)

All aspects of waves and tides; survey of tidal theory and analysis. Prerequisite: Math 24 or 33, Ocea 101.

112 Biological Oceanography (3)

Biological science as related to marine environment. Prerequisite: Ocea 102.

113 Marine Geophysics (3)

Principles of geophysical measurements and interpretation, earthquake seismology, sound propagation, seismic refraction, and reflection at sea. Elastic wave propagation considerations in liquid and solid media. Sound transmission with special application to SOFAR channel studies. Selected reflection and refraction studies offshore; geophysical investigations of some selected trenches. Instruments, i.e., Precision Depth Recorder (PDR), etc. A description of the specialties in the discipline of earthquake seismology and their application in furthering knowledge of the earth's interior. Prerequisite: Geop 105, Phys 1.

114 Chemical Oceanography (3)

Chemical processes in the marine environment, including composition of sea water, nutrients, natural composition, and variation, carbonate cycle, geochemistry, and extraction. Prerequisite: Chem 12, Ocea 101.

115 Geological Oceanography (3)

Physiography of the sea floor and geological processes of the ocean basins and margins, properties and distribution of sediments and rates of deposition; distribution of minerals, structure and origin of the ocean basins. Prerequisite: Ocea 102.

Philosophy

Chairman: R.H. Schlager, Professor of Philosophy; Rice 611, Telephone: 676-6266

61-62 Introduction to Philosophy (3-3)

(Phil 61 replaces former 52; Phil 62 replaces former 51)

Problems of modern philosophy in relation to scientific and social developments since the Renaissance. Phil 61: theories of reality. Phil 62: theories of knowledge. Phil 61 or 62 may be taken independently.

Physical Education

Chairman: J.L. Breen, Professor of Physical Education; S-20, Telephone: 676-6250;
K-20, Telephone: 676-6280

*4 Physical Education Activities (1)

Two periods a week of instruction in coeducational physical education activities chosen from those offered each semester. May be repeated for credit not to exceed 4 semester hours.

*5 Physical Education Activities (1) (men)

Two periods a week of instruction in physical education activities chosen from those offered each semester. May be repeated for credit not to exceed 4 semester hours.

*6 Physical Education Activities (1) (women)

Instruction in physical education activities (3 periods a week for first-year students; two periods a week for second-year students) chosen from those offered each semester. May be repeated for credit not to exceed 4 semester hours.

101 Physical Education in the Elementary School (3)

For Elementary Education and Physical Education majors. Implications of child growth and development for school and playground programs; philosophy, curriculum, techniques of teaching, facilities and equipment evaluation.

215 Administration of High School Athletics (3)

Open only to majors in Physical Education. Lecture (2 hours), conference (1 hour). For the prospective high school athletic director. The philosophy, principles, and procedures essential for the administration and development of a sound athletic program.

258 Safety Education—Care and Prevention (3)

Care and prevention of athletic injuries, school safety, first aid, and liability. Leads to Instructor Certification in First Aid.

263 Basic Simulation—Driver Education (3)

Orientation and psychological foundations of simulator instruction. Operation, care, and preventive maintenance; organization and administration of a driver education simulator program.

Physics

Chairman: Julian Eisenstein, Professor of Physics; Corcoran 102, Telephone: 676-6275

Departmental prerequisite: Phys 31-32 or equivalent, and consent of a departmental adviser, are prerequisite to all courses in Physics numbered from 101 to 200.

* A Physical Education fee of \$4.50 a semester is required for registration in one or more of the activity courses.

1 General Physics (4) (Campus Course)

Topics in classical physics which form a foundation for modern physics. Prerequisite: two years of college preparatory mathematics or concurrent registration for Math 6. Laboratory fee, \$11.

2 Introduction to Modern Physics (4) (Campus Course)
(Formerly General Physics)

Selected topics in modern physics, including electromagnetic phenomena. Prerequisite: Phys 1 or equivalent. Phys 1 can be waived on the basis of the College Entrance Examination Board Achievement Test or by a departmental examination prior to registration. Laboratory fee, \$11.

9-10 Introduction to Astronomy (3-3) (Campus Course)

Lecture (2 hours), recitation (1 hour), laboratory (2 hours). Classical through modern astronomy with introduction to basic principles underlying astronomical systems and observations. Primarily for nonscience majors. Laboratory fee, \$11 a semester.

Political Science

Chairman: H.L. LeBlanc, Professor of Political Science and Public Affairs; C-619, Telephone: 676-6290

Departmental prerequisite: P Sc 5-6 is prerequisite to courses in Political Science numbered from 101 to 200.

5-6 Introduction to Political Science (3-3)

P Sc 5: an introduction to the study of comparative political systems. Emphasis on contemporary concepts and techniques used to examine politics and government. P Sc 6: structure, powers, and processes of American political systems—Congress, the President, and the Supreme Court; elections, political parties, and pressure groups; state and local governments.

103-4 State and Local Governments (3-3)

(Replaces former P Sc 103 Metropolitan Government and Politics and P Sc 104 State and Local Governments)

P Sc 103: state and local political systems, theory of sub-national governments, intergovernmental relations, metropolitan government and politics. P Sc 104: urban political systems, issues in urban politics, city and regional planning, and the political process.

111 Comparative Government and Politics (3)

Introduction to the government and politics of the principal constitutional democracies of Western Europe: Great Britain, France, and the Federal Republic of Germany; secondary reference to other West European systems and the communist government of East Germany.

***112 Comparative Government and Politics (3)**

Introduction to the government and politics of the communist nations; emphasis on the Soviet Union and the countries of Eastern Europe.

*P Sc 112, 115, and 161 are related in their subject matter, and credit for only one of the three may be applied toward a degree.

121-22 U.S. Constitutional Law and Politics (3-3)

P Sc 121: separation of powers, federal-state relationships, economic regulation. P Sc 122: political and civil rights. Prerequisite: junior status.

125 The American Congress (3)
(Formerly Legislative Organizations)

Congress: the legislative process of the House of Representatives and Senate. The men, the committees, and the system.

126 The American Presidency (3)

Role of the Presidency in public policy formulation, development of the institution, the selection process, emphasis on legislative-executive relations.

145 Political Parties and Politics (3)

Organization and operation of political parties in the United States: party system and structure, role of ideology, voting behavior, campaigns and elections, devices for organizing the government.

146 Political Pressures and Public Reactions (3)

Public opinion, special interest lobbies, and pressure groups as they operate on government to influence public policy.

151 Public Administration (3)

Theory and practice of governmental administration, administrative systems in the public and private sectors, introduction to organization theory and behavior.

167 U.S. Foreign Policy (3)

Constitutional and political factors that determine the formulation, execution, and substance of U.S. foreign policy.

171 International Politics (3)

International actors, international and domestic environments of foreign policy, global and regional patterns, general characteristics of foreign policy.

172 International Organization (3)

Development and operations of the United Nations, regional organizations, and functional international organizations.

181-82 Public International Law and Organization (3-3)

Survey of the public law of nations. P Sc 181: emphasis on the law of peace. P Sc 182: continuation of the law of peace; attention to neutrality and the so-called law of war.

190 Politics of Middle and Southern Africa (3)

Comparative analysis of the political systems of selected countries of non-Mediterranean Africa.

191 Governments and Politics of the Middle East (3)

Domestic and international politics of the eastern Arab states, Turkey, Iran, and Israel.

192 Governments and Politics of North Africa (3)

Domestic and international politics of Algeria, Tunisia, Morocco, Libya, Egypt, Sudan; their relations with states of the Middle East.

193 Governments and Politics of South and Southeast Asia (3)

Domestic and international politics of the major states in the area, particular reference to India.

194 Governments of China and Japan (3)

Institutions and processes of the government of contemporary China and Japan, with some historical background. Attention to ideological forces. Students cannot receive credit for both P Sc 194 and 162.

212 Seminar: Comparative Government and Politics (3)

Selected topics in comparative political institutions and politics. Each semester is devoted to a selected country or significant institutional or policy problem. Attention is directed to questions of method.

233 Seminar: Soviet Government and Politics (3)

Research seminar in selected problems of Soviet domestic government and politics. Emphasis: since Stalin. Prerequisite: P Sc 229 or permission of instructor.

271-72 Problems in International Organizations (3-3)

P Sc 271: analysis of the political dimension of international organizations; special reference to the United Nations. P Sc 272: examination of the operational and administrative aspects of international organizations; special reference to regional and functional bodies.

***283 Topics in International Law (3)**

Consideration of theory, problems, and cases in the public law of nations including the law of peace and the law of war.

***285 Diplomacy since World War II (3)**

Recent changes in diplomatic procedures and objectives as compared with those of earlier periods.

299-300 Thesis Research (3-3)

Psychology

Chairman: B.I. Levy, Professor of Psychology; Monroe 405, Telephone: 676-6320

Departmental prerequisite: Psyc 1 or 5 or 6 is prerequisite to all other courses in Psychology. Six semester hours in Psychology courses are prerequisite to Psychology courses numbered above 100.

1 General Psychology (3)

Fundamental principles underlying human behavior.

* Offered in War College programs only.

8 Psychology of Motivation and Personality (3)

Introduction to psychology of personality. Principles of motivation, personality development, social and cultural factors, assessment and description of personality emphasized.

22 Introduction to Educational Psychology (3)

Consideration of individual and group differences, adjustments, and the psychology of learning in relation to education and training.

29 Psychology of Childhood (3)

Developmental approach to study of the child. Emphasis on the socialization process, learning, and the child's view of the world.

101 Abnormal Psychology (3)

Causes, diagnosis, treatment, and prevention of various types of maladjustments and mental disorders. Prerequisite: 6 semester hours in psychology, or 3 in psychology and 6 in a biological science.

112 Psychology of Adolescence (3)

Psychological characteristics and problems peculiar to adolescence, with emphasis on applications of psychology to solution of such problems.

121 Psychology of Learning (3)

Current learning theories and issues.

129 Theories of Personality (3)

(Formerly Motivational Factors in Personality)

Survey of personality theories; emphasis on their application to problems of individuals.

131 Psychological Tests (3)

Survey of psychological tests and their more common uses in business, industry, government, law, medicine, and education. Material fee, \$7.

144 Personnel and Industrial Psychology (3)

Psychological concepts and methods applied to problems of personnel management, human engineering, employee motivation, and productivity.

145 Psychology of Management (3)

Introduction to principles of industrial organizations and personnel selection. Departmental prerequisite waived.

151 Social Psychology (3)

Social foundations of attitudes and behavior: cognition, motivation, role-behavior, communication, small-group processes, racial attitudes, nationalism, and war.

156 Psychology of Attitudes and Public Opinion (3)

Psychology of opinion formation, measurement of opinion, social determinants of attitudes, psychological processes in propaganda, bases of receptivity to propaganda, psychological warfare.

Public Administration

Chairman: D.R. Cloutier, Professor of Public Administration; Hall of Government,
Telephone: 676-6295

213 Administration in Government (3)

Critical analysis of federal administrative organizations as an integral part of the political system. Roles of Congress, the Presidency, the Courts, interest groups, political parties, and the public in the administrative process; special attention to centripetal and centrifugal forces.

215 Comparative Administrative Systems (3)

Examination and analysis of the administrative systems of selected foreign governments; attention to practices applicable to administration in the United States.

218 Seminar: Developmental Administration II (3)

Problem of the transfer of administrative capability from one country to another. Political and administrative development. Unilateral and multi-lateral approaches. The role of the innovator. Strategies of administrative development.

221 Management in the Executive Branch (3)

Analysis of application of management theory and practice in the Executive Branch of the Federal Government, emphasis on staff responsibilities and relationships and internal organization and control.

223 Behavioral Factors in Large Organizations (3)

Analysis of the nature and characteristics of bureaucracy; dysfunctionism; approaches to policy guidance and leadership, particularly in large public organizations; influence and control systems.

231 Public Personnel Administration (3)

Survey of basic principles and functions of personnel administration in the public service. Roles of personnel management, recruitment, placement, wage and salary administration, training, retirement, and other personnel functions.

232 Problems in Public Personnel Management (3)

Analysis and evaluation of major personnel management problems in government; employee-management relations; interagency and intergovernmental relationships. Impact of automation. Evaluation of personnel systems.

233 Seminar: Manpower Development and Utilization (3)

Analysis of manpower resources. Research projects and case studies in ways and means of increasing employee potential; use of training programs, executive development, incentive systems.

235 Technological Change and Manpower (3)

Research, discussion, and readings dealing with manpower problems arising from automation and other technological changes. Evaluation of these developments in government and business; their implications for productivity, employment, training and education, and personnel and industrial relations. Analysis of economic, political, and social factors influencing public and private industry manpower policies.

246 Urban Dynamics (3)

Forces that lie behind economic decisions which in turn determine the development of cities.

248 Financing Metropolitan Services (3)

Analysis of the structure and administration of public finance of local governments.

249 Administration in Metropolitan Area Governments I (3)

Examination of public administration at the local level. Developments and trends growing out of the changing urban pattern.

250 Administration in Metropolitan Area Governments II (3)

Examination of newly emerging political and social groups in metropolitan areas and their relations to governmental administration. Examination of federal programs in metropolitan areas. Prerequisite: P Ad 249 or permission of instructor.

251 Governmental Budgeting (3)

Survey of the basic concepts, principles, and practices in governmental budgeting; interrelationship of planning, programming, and budgeting; their role in the management process.

252 Problems in Planning, Programming, and Budgeting (3)

Intensive analysis of developments in federal planning, programming, and budgeting; application of new tools in the decision-making process; evaluation of the systems.

254 Seminar: Financial Management in the Federal Service (3)

Functions and interrelationships of central federal financial management agencies, their policy, economic and managerial roles, controllership functions, and standards and practices in financial management.

260 Seminar: Policy Formulation and Administration (3)

Analysis in depth of factors and processes involved in policy development, with particular attention to selected areas of national policy; development of agency goals and objectives.

262 Seminar: Science, Technology, and Public Policy (3)

The impact of science and technology upon public administration in terms of both administrative practice and national policies.

298 Case Studies in Public Administration (3)

Analysis and discussion of problems in public management by use of the case method.

299 Thesis Seminar (3)

Examination of thesis standards, research philosophy and methodology.

300 Thesis Research (3)

Religion

Chairman: R.G. Jones, Professor of Religion; O-12, Telephone: 676-6325

9 The Old Testament (3)

Historical and literary study of the Old Testament with consideration of development of religious ideas, institutions, and outstanding personalities.

10 The New Testament (3)

Study of New Testament literature from the standpoint of occasion, purpose, dominant ideas, and permanent values. Emphasis on approach, structure, and significance of the Gospels and Epistles.

21 Introduction to Religious Thought (3)

Traditional religious concepts, language of contemporary religion amidst modern scientific and secular intellectual tendencies, and the place of religion in today's society.

59-60 History of Religions (3-3)

Origins, evolution, and contemporary status in historical context. Rel 59: primitive religion and the religions of the East (Hinduism, Buddhism, Taoism, Confucianism, Shinto). Rel 60: religions of the West and Near East (ancient religions, Judaism, Christianity, Islam).

Slavic Languages and Literatures

Chairman: C.A. Moser, Associate Professor of Russian; D-200, Telephone: 676-6335

1-2 First-year Russian (3-3)

A year course: credit toward a degree at this University given on completion of Slav 2. Beginners' course in fundamentals of grammar and pronunciation with graded reading, oral drill, and written practice. Listening comprehension and oral practice.

*1S-2S Scientific Russian for Beginners (3-3)

An introduction to the essentials of Russian grammar and reading of modern scientific texts.

3-4 Second-year Russian (3-3)

A year course: credit toward a degree at this University given on completion of Slav 4. Systematic review of grammar. Study of special problems of Russian morphology and syntax. Oral and written reports on assigned topics. Prerequisite: Slav 1-2 or two years of high school Russian.

9-10 Russian Conversation and Composition (3-3)

Listening comprehension; oral and written practice. Prerequisite: Slav 4 or permission of instructor.

* This is a special course. It cannot serve as a prerequisite to any advanced course in Slavic Languages and Literatures.

91-92 Introduction to Russian Literature (3-3)

Survey of Russian literature, in translation, from earliest periods through literary masterpieces of the 19th and early 20th centuries. Lecture, recitation, and discussion—in English.

109-10 Advanced Russian Conversation and Composition (3-3)

Developing proficiency in oral and written expression. Prerequisite: Slav 10 or equivalent. Term paper required.

161-62 Russian Culture (3-3)

Survey of Russian cultural heritage from origins of ancient Russia to present—in English. Lecture, recitation, discussion, and individual reports on assigned topics.

165 Soviet Literature from the Revolution to World War II (3)

Basic themes, issues, literary figures of the Soviet 1920's. The fate of literature and writers under increasing state control; Five-year Plan literature. Lecture, discussion, reports—in English.

166 Soviet Literature from World War II to the Present (3)

Literature in wartime, under Stalinism, and in the "thaws." The new generation of dissident liberals and "underground" literature. Lecture, discussion, reports—in English.

193-94 Introduction to Slavic (non-Russian) Literature—in English (3-3)

An examination of non-Russian Slavic literatures from their beginnings to the present day. Emphasis on themes, ideas, and styles peculiar to each literature. The impact of national events and culture on each.

Sociology

Chairman: R.G. Brown, Professor of Sociology; Chapin 203, Telephone: 676-6345

Departmental prerequisite: Soc 1 and either 2 or 61 are prerequisite to all other courses in Sociology.

1-2 Introductory Sociology (3-3)

Soc 1: general principles of sociology; development of culture and personality, impact of groups and institutions on man's social behavior. Survey of fields within sociology. Soc 2: analysis of major social problems confronting the United States; factors producing social problems, their nature and treatment.

124 Medical Sociology (3)

Sociological factors and processes which relate to physical and mental health and disease, analysis of patterned social relationships in the field of health and medicine, the hospital as a social system.

126 Urban Sociology (3)

Place of the city in larger society; growth of the city, problems of urban living, group life, personality, urban housing, city planning, and suburban development.

127 Population Problems (3)

Composition of populations, trends in population growth and population pressure, factors producing population movements, effects of migration, population policies—eugenics and birth control.

129 Race and Minority Groups (3)

Analysis of relationships between dominant and minority groups in society, particularly in the United States; nature and range of problems; analysis of the phenomenon of prejudice.

130 Social Stratification: Class and Status (3)

Nature of class structure, patterns of status, prestige relations, differential class behavior, analysis of comparative social structure and social mobility.

131 Social Institutions (3)

Functional analysis of basic social institutions: family, education, religion, economy, and state in the structure of American society.

133 Sociology of Education (3)

Analysis of educational systems from an institutional and organizational perspective and as agencies of socialization; relationships of education in general to society, including technological, communal, and subcultural components.

134 Marriage and the Family (3)

Courtship as a social process, marriage and marital adjustment, development of the family, parent-child relations, family problems, disorganization, divorce and family reorganization.

135 Juvenile Delinquency (3)

Factors producing delinquency, juvenile detention, the juvenile court, training schools, treatment of offenders.

136 Criminology (3)

Nature and distribution of crime as related to the development and operation of criminal law and various social and legal institutions in the urban society.

138 Social Disorganization (3)

Analysis of factors contributing to disruption of social groups, institutions, and communities; study of attempts to establish social controls to prevent, minimize, or mitigate the effects of socially disruptive conditions and events.

139 Society and the Deviant (3)

Analysis of relationships of society, socialization, and deviancy. Social responses to deviancy and criminal offenders; rehabilitative program in community, courts, and schools.

141 Social Research Methods (3)

Introduction to scientific method in the development of social theory and the solution to social problems. Prerequisite: Stat 53 or 104.

149 Modern Sociological Theory (3)

Systematic study of contemporary schools of sociological theory, both European and American development; evaluation of scientific contributions of each school. Prerequisite: Soc 61.

Spanish*

Chairman: J.F. Burks, Associate Professor of French; A-11, Telephone: 676-6330

1-2 First-year Spanish (3-3)

A year course: credit toward a degree at this University given on completion of Span 2. For beginners. Pronunciation, conversation, grammar, composition, reading of modern Spanish prose.

3-4 Second-year Spanish (3-3)

A year course: credit toward a degree at this University given on completion of Span 4. Conversation, grammar, composition, reading of modern Spanish prose, introduction to Hispanic civilization. Prerequisite: Span 1-2 or two years of high school Spanish.

51-52 Survey of Spanish Literature and Civilization (3-3)

Social, artistic, and cultural background of Spanish literature. Lectures, readings, recitations, and informal discussions.

Special Education

Chairman: Perry Botwin, Professor of Special Education; C-429, Telephone: 676-6170

201 Introduction to Special Education (3)

(Formerly Introduction to the Education of Exceptional Children)

Survey course to acquaint prospective teachers with special education and to help them become aware of the various educational modifications necessary to accommodate children in a school program.

204 Problems in Urban Education (3)

Problems and issues in urban education; emphasis on factors affecting successful educational practice in low-income areas. Admission by permission of instructor.

240 Educational Programming for Children with Behavioral Problems (3)

Analysis of educational provisions for children with behavioral problems through study of ecological considerations in the light of contemporary special education theory. Admission by permission of instructor.

* Administered by the Department of Romance Languages and Literatures.

- 242 Clinical Teaching of Children with Behavioral Problems (3)**
(Formerly Clinical Teaching of Emotionally Disturbed Children)
 Lectures and discussions exploring various psychoeducational techniques of teaching children and adolescents with behavioral problems, interpersonal interaction between teachers and disturbed children, use of group factors in the teaching-learning process, and selection of appropriate teaching methods and materials. Admission by permission of instructor.
- 251 Psychosocial Considerations in Special Education (3)**
 Psychological and sociological factors in special education programs and practices. Admission by permission of instructor.
- 263 Special Teaching of Severely- and Multiply-handicapped Children (3)**
 Specialized programs, techniques, and methods for teaching children with severe disabilities. Admission by permission of instructor.
- 303 Administration and Supervision of Special Education (3)**
 Philosophy and nature of special education; program organization, administration, and development. Surveying local-level needs; program evaluation and supervision. Admission by permission of instructor.
- 304 Recent Research and Trends in Special Education (3)**
(Formerly Recent Research and Trends in Exceptional Children)
 Emphasis on research methodology and considerations. The unique problems of doing research in special education. Procedures and sources for obtaining research funding. Admission by permission of instructor.
- 306 Guidance and Counseling Families of Children with Special Needs (3)**
(Formerly Guidance and Counseling of Exceptional Children)
 Working with parents and community agencies in meeting the educational and social needs of young children. Admission by permission of instructor.
- 308 Instructional Media and Technology in Education: Past, Present, and Future Relationships and Implications (3)**
 A review and consideration of technological developments as they affect special education; consideration of operating principles of various kinds of hardware, including printing, audio-visual equipment, television, and computers; status of software for use with hardware. Admission by permission of instructor.
- 342 Seminar: Crisis/Resource Teaching (3)**
(Formerly Advanced Seminar: Emotional Disturbance)
 Topics and concepts relevant to an exploration of alternative models in the education of children with behavioral problems. Admission by permission of instructor.
- 360 Learning Disabilities: Identification and Implications (3)**
 A study of the nature of various learning disabilities and the implications for meeting the developmental needs of the child.
- 370 Intrapersonal Dynamics in Special Education (3)**
 Small group exploration of intrapersonal factors essential to understanding roles and interpersonal techniques in teaching exceptional children. Admission by permission of instructor.

Speech and Drama

Chairman: G.F. Henigan, Professor of Speech; Auditorium 6, Telephone: 676-6350

1 Communicative Speaking and Listening (3)

(Formerly Effective Speaking)

Basic theories and principles of speech communication; composition, delivery, and criticisms of speaking in interpersonal, group, and public situations. Recording fee, \$2.

11 Voice and Diction (3)

Development of naturalness, correctness, and clarity in conversational speech. Analysis and correction of individual speech delivery faults through tapes and weekly performances. Class instruction on concepts of acceptable voice and diction standards. Recording fee, \$4.

91 Parliamentary Procedure and Group Participation (3)

Principles and procedures for effective speech communication to function successfully at various levels of responsibility in academic, social, professional, civic, or business organizations. Prerequisite: Sp&D 1 or 11, or permission of instructor.

*111 Business and Professional Speaking (3)

(Formerly Effective Speech Communication)

Study of the communication process in business and professional speaking; practice in presenting technical reports; selling policies, programs, and services; interviews; conferences; speech in training and supervisory activities. Primarily for nonmajors.

121 Group Discussion and Conference Leadership (3)

Process of thinking and problem solving in committees and small groups; methods of leading discussions and conferences. Prerequisite: Sp&D 1 or permission of instructor.

Statistics

Chairman: Solomon Kullback, Professor of Statistics; C-311, Telephone: 676-6355

Departmental prerequisite: one entrance unit in algebra is prerequisite to courses in Statistics numbered below 100.

†51 Introduction to Business and Economic Statistics (3) (Campus Course)

Lecture (3 hours), laboratory (1 hour). Frequency distributions, descriptive measures, probability, sampling, estimation, tests of hypotheses, correlation, time series, index numbers. Laboratory fee, \$9.

†52 Mathematics of Finance (3) (Campus Course)

Interest and discount, annuities, valuation of stocks and bonds, sinking funds, amortization, valuation of depletable assets, depreciation.

* This course can be adapted to the needs of a specific group.

† Stat 101-2; *Basic Principles of Statistical Methods* (3-3), which is offered off campus, may be substituted.

101-2 Basic Principles of Statistical Methods (3-3)

Variables and attributes, averages and dispersion, elementary principles of sampling, introduction to the making of statistical decisions.

107 Statistics for Engineers (3)

Probability models, discrete and continuous distributions, sampling, hypothesis testing and estimation, engineering applications. Prerequisite: differential and integral calculus.

109-10 Quality Control and Reliability Techniques (3-3)

Statistical methods and probability models for quality control and reliability applications. Prerequisite: Stat 91 or 107.

111 Business and Economic Statistics I (3)

Statistical processes as tools in decision making in areas of economics and business. Prerequisite: Stat 51 or permission of instructor.

112 Business and Economic Statistics II (3)

Case work to illustrate quantitative procedures for solution of economic and business problems. Prerequisite: Stat 111 or equivalent.

Swedish*

Chairman: Carl Steiner, Associate Professor of German; Rice 408, Telephone: 676-6195

1-2 First-year Swedish (3-3)

A year course: credit toward a degree at this University given on completion of Swed 2. Essentials of Swedish grammar, conversation, composition, and reading of simple prose.

* Administered by the Department of Germanic Languages and Literatures.

THE UNIVERSITY

HISTORY

GEORGE WASHINGTON UNIVERSITY had its beginning in 1821 as The Columbian College in the District of Columbia. The name of the institution was changed in 1873 to Columbian University and in 1904 to The George Washington University. The debt of the University to George Washington, whose name it bears, is an intangible one.

George Washington, as President and as private citizen, had urgently insisted upon the establishment of a National University in the Federal City. There he hoped that, while being instructed in the arts and sciences, students from all parts of the country would acquire the habits of good citizenship, throwing off local prejudices and gaining at first hand a knowledge of the practice, as well as the theory of republican government. To further the materialization of his hopes, Washington left a bequest of fifty shares of The Potomac Company "towards the endowment of a University to be established within the limits of the District of Columbia, under the auspices of the General Government, if that government should incline to extend a fostering hand towards it." The Congress never extended "a fostering hand." The Potomac Company passed out of existence, and Washington's bequest became worthless.

Fully conscious of Washington's hopes, but motivated primarily by a great missionary urge and the need for a learned clergy, a group of dedicated ministers and laymen sponsored a movement for the establishment of a college in the District of Columbia. Inspired largely by the zeal and energy of the Reverend Luther Rice, they raised funds for the purchase of a site and petitioned Congress for a charter. After much delay and amendment, Congress granted a charter which was approved by President Monroe on February 9, 1821. To safeguard the College's nonsectarian character it provided "That persons of every religious denomination shall be capable of being elected Trustees; nor shall any person, either as President, Professor, Tutor or pupil, be refused admittance into said College, or denied any of the privileges, immunities, or advantages thereof, for or on account of his sentiments in matters of religion."

During the entire time when the institution was known as Columbian College, its activities were centered on College Hill, a tract of forty-six and a half acres between the present Fourteenth and Fifteenth Streets extending north from Florida Avenue to somewhat beyond Columbia Road. The Medical School was located downtown. For the better part of the Columbian University period, the buildings of the University were situated along H Street between Thirteenth and Fifteenth Streets. The Medical School group still remains there.

During the last half century the University's present plant has been developed in that section of the old First Ward familiarly known as "Foggy Bottom,"

between Nineteenth and Twenty-fourth Streets, south of Pennsylvania Avenue. The area is not without its reminders of historic interest to the University. President Monroe, who signed the charter, lived at 2017 Eye Street. The first President of the Board of Trustees, the Reverend Obadiah B. Brown, was for fifty years the pastor of a church at Nineteenth and Eye Streets, and Washington selected Twenty-third and E Streets as the site of the National University he had hoped to see established.

THE COLLEGES, SCHOOLS, AND DIVISIONS

George Washington University includes eleven colleges, schools, and divisions, as follows:

*Columbian College of Arts and Sciences**, through its lower and upper divisions, offers four-year programs in the arts and sciences leading to the degrees of Bachelor of Arts, Bachelor of Science, and (in cooperation with the Department of Pathology and the University Hospital) Bachelor of Science in Medical Technology. The lower division also provides the first two years of the prelegal and premedical programs; the preprofessional work required for admission to the School of Education, the School of Government and Business Administration, and the School of Public and International Affairs; and a terminal Associate in Arts curriculum in Accounting. Columbian College also has academic jurisdiction over off-campus programs leading to the degrees of Bachelor of General Studies, Bachelor of Science in Environmental Health, Bachelor of Science in Geodetic and Cartographic Science, and Bachelor of Science in Oceanography. These off-campus programs are administered by the College of General Studies.

*The Graduate School of Arts and Sciences** offers advanced study and research leading to the degrees of Master of Arts, Master of Fine Arts, Master of Music, Master of Science, and Doctor of Philosophy.

*The School of Medicine** offers work leading to the degree of Doctor of Medicine.

The National Law Center offers courses leading to the degrees of Juris Doctor, Master of Laws, Master of Comparative Law, Master of Comparative Law (American Practice), and Doctor of Juridical Science; and special programs in Continuing Legal Education.

The School of Engineering and Applied Science offers courses leading to the degree of Bachelor of Science in the following areas: Civil Engineering, Electrical Engineering, Measurement Science, and Mechanical Engineering. Graduate programs lead to the degrees of Master of Science, Master of Engineering Administration, and Doctor of Science. The School also has academic jurisdiction over the off-campus Master's degree programs at the NASA-Langley Research Center and the Naval Ship Research and Development Laboratory. These off-campus programs are administered by the College of General Studies.

The School of Education offers undergraduate programs leading to the degrees of Bachelor of Arts in Education and Bachelor of Science in Physical Education; graduate studies leading to the degrees of Master of Arts in Education, Master of Arts in Teaching, Education Specialist, and Doctor of Education.

* Columbian College of Arts and Sciences and the Graduate School of Arts and Sciences cooperate with the School of Medicine in offering the combined degrees of (1) Bachelor of Arts and Doctor of Medicine and (2) Master of Science and Doctor of Medicine.

The School of Government and Business Administration offers undergraduate programs leading to the degree of Bachelor of Business Administration and graduate programs leading to the degrees of Master of Arts in Government, Master of Arts in Health Care Administration, Master of Business Administration, Master of Public Administration, Master of Urban and Regional Planning; the Graduate Certificate in Health Care Administration; the degrees of Doctor of Business Administration and Doctor of Public Administration. The School also has academic jurisdiction over off-campus programs leading to the degrees of Bachelor of Science in General Studies and Master of Science in Administration, which are administered by the College of General Studies.

The School of Public and International Affairs offers undergraduate programs leading to the degree of Bachelor of Arts and graduate programs leading to the Certificate of the Institute for Sino-Soviet Studies and the degree of Master of Arts. The School has academic jurisdiction over the off-campus program leading to the degree of Master of Science in International Affairs, which is administered by the College of General Studies.

The College of General Studies supplements the adult education program of the University through campus and off-campus study; conferences, seminars, and special projects; and continuing education and noncredit programs. This College also administers the off-campus programs over which Columbian College of Arts and Sciences, the School of Engineering and Applied Science, the School of Government and Business Administration, and the School of Public and International Affairs have academic jurisdiction.

The Division of University Students makes available courses for students not candidates for degrees in this University.

The Summer Sessions.

ACADEMIC STATUS

George Washington University is accredited by its regional accrediting agency, the Middle States Association of Colleges and Secondary Schools.

The University is on the approved list of the American Association of University Women and is a member of the College Entrance Examination Board.

The School of Government and Business Administration has maintained full membership in the Middle Atlantic Association of Colleges of Business Administration since 1961. It joined the Council on Graduate Education for Public Administration in 1966. By invitation, in 1968, the School became a charter academic member of the American Association of Collegiate Schools of Business Assembly. The programs in Public Accounting designed to prepare students for Certified Public Accountants examinations have been approved by the state boards of New York and of Maryland. The program in Health Care Administration has been accredited by the Association of University Programs in Hospital Administration since 1962.

LOCATION

The University is in downtown Washington, between Pennsylvania Avenue and 19th, F, and 24th Streets, N.W. In immediately adjacent areas are the White House, the World Bank, the United States Information Agency, the Corcoran Gallery of Art, the Department of the Interior, the General Services Administration, the National Academy of Sciences, and the Kennedy Center for the Performing Arts.

GOVERNMENT

The University is privately endowed and is governed by a self-perpetuating Board of Trustees, with the President of the University as an ex officio member. The members of the Board are named for a period of three years and are divided into three classes. The members of one class are elected at each annual meeting to fill the places of the members whose terms of office expire. Two members of each class are nominated by the Alumni Association.

THE GENERAL ALUMNI ASSOCIATION

The objectives of this Association are to unite the graduates who wish to associate themselves for charitable, educational, literary, and scientific purposes, and to promote the general welfare of the University.

Eligible members are those who have matriculated in any school of the University and who have left the University in good standing, or any person who is or has been a member of the teaching, research, or administrative staff of the University, or of the Board of Trustees of the University. Active members are those eligible members who are current contributors (dues or otherwise) to or life members of the George Washington University General Alumni Association, the Alumni Association of any school of the University, or contributors to the George Washington University Fund.

The Alumni Office is in Bacon Hall, 2000 H Street, N.W., Washington, D.C. 20006.

All alumni are urged to keep the Alumni Office informed of changes of address or occupation and to supply information with regard to their fellow alumni.

THE BOARD OF TRUSTEES

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SCHOOL OF PUBLIC AND INTERNATIONAL AFFAIRS

- Burton Malcolm Sapin, Ph.D., *Dean of the School of Public and International Affairs*

APPENDIX: RECENTLY ESTABLISHED REGULATIONS

THE FOLLOWING UNIVERSITY REGULATIONS are under review and may be subject to change in connection with the establishment of judicial processes. Bulletins and handbooks incorporating any changes will be issued as appropriate.

The following resolution, submitted by the University Senate, was approved by the University's Board of Trustees on October 19, 1968:

Whereas, safety and order are essential preconditions of the learning process, and indeed of the very concept of a university; and

Whereas, The George Washington University is committed to protection of free speech and freedom of assembly, and to safeguarding the right of lawful protest on campus; and is committed equally to maintaining the peace and safety of the campus, in the knowledge that all rights are in jeopardy when violence and civil disorder prevail over law and reason;

Now, therefore, be it resolved by the Senate of The George Washington University: that in the event a demonstration at this University exceeds the bounds of free assembly and lawful advocacy, and demonstrators are engaging in unlawful acts which cause or imminently threaten injury to persons or property, or which obstruct or interfere with normal and necessary University activities, this body affirms the authority of the President, or other University officials designated to act in his absence, to take such reasonable steps, if possible after consultation with the Chairman of the Executive Committee of the University Senate and the President of the Student Body, as are required to restore and preserve order; including, if deemed necessary and appropriate, suspension of students or faculty engaging in such acts, and use of such law enforcement personnel as are needed to effect the removal, arrest, and prosecution of law violators. Any such suspension shall be reviewed by an appropriate tribunal as soon after order is restored as is practicably possible.

The following was approved by the University's Board of Trustees on October 19, 1968:

Any student suspended from The George Washington University on the grounds of exceeding the bounds of free assembly and lawful advocacy shall have his suspension reviewed by the Hearing Committee on Student Affairs of The George Washington University as soon after order is restored as is practicably possible.

The following resolution, submitted by the Student Life Committee, was approved by the University's Board of Trustees on October 19, 1968:

Be it resolved that The George Washington University: affirms its traditional commitment to freedom of expression (a) by continuing to permit business and government organizations which are recruiting employees to conduct their activities at designated places on campus, and (b) by placing no obstacle to students who may wish to protest the presence of such recruiters, provided, however, that such protest shall be orderly and shall not impede or disrupt the recruiter in his activities.

The University affirms its place as a forum for the free exchange of ideas (a) by assuring that guests invited to speak on this campus at duly scheduled meetings shall have the right to appear and to be heard, and (b) by sanctioning the freedom of students to express dissent from the views of the speaker, provided, however, that that expression of dissent be orderly and nonobstructive.

The University distinguishes between orderly protest and resistance-by-obstruction; it accepts the former as a legitimate expression of dissent while rejecting the latter as an abridgement of the freedoms of the individuals who may be its object.

The following was approved by the University's Board of Trustees on October 19, 1968:

The George Washington University is opposed to discrimination based on race, color, or creed. Such discrimination may have appeared in campus organizations in the past. In the future, however, no organization can be recognized or supported by the University unless it provides continued assurance of nondiscrimination in membership practices and in intent, considered adequate by relevant committees and officers of the University.

The following was approved by the University's Board of Trustees on October 19, 1968:

The University cannot condone violations of law, including violation of those laws which proscribe possession, use, sale, or distribution of certain drugs. Members of the academic community should know that administrative action, which may include dismissal from the residence halls, revocation of other privileges, or suspension or dismissal from the University, may be taken in order to protect the interests of the University and the rights of others.

The Board of Trustees reaffirms the responsibility of the President and the Faculty to continue to implement this policy.

The following resolution, submitted by the University Senate, was approved by the University's Board of Trustees on January 16, 1969:

Be it resolved by the Senate of The George Washington University: Any member of the University (including as members of the University all persons having a formal connection with the University)

(a) who engages in conduct that unreasonably obstructs teaching, research, and learning, or

(b) who unreasonably obstructs free access to members or guests of the University or to University buildings, or

(c) who disobeys general regulations of the University, or

(d) who damages University property or injures members or guests of the University,

may be punished for his conduct by dismissal from the University, or by some lesser disciplinary action, through procedures established within the University for the government of its members.

In order to insure due process, any student subject to dismissal or other disciplinary action on the grounds of violating any of the premises of this resolution shall have, at his discretion, the right of review of the action by the University Hearing Committee on Student Affairs.

COLLEGES AND SCHOOLS—DEGREE PROGRAMS

COLUMBIAN COLLEGE OF ARTS AND SCIENCES: Associate in Arts (A.A.), Bachelor of Arts (B.A.), Bachelor of General Studies (B.Gen.Std.), Bachelor of Science (B.S.), Bachelor of Science in Environmental Health (B.S. in Env.Health), Bachelor of Science in Geodetic and Cartographic Science (B.S. in Geod. and Cart.Sc.), Bachelor of Science in Medical Technology (B.S. in Med.Tech.), and Bachelor of Science in Oceanography (B.S. in Ocea.)

GRADUATE SCHOOL OF ARTS AND SCIENCES: Master of Arts (M.A.), Master of Fine Arts (M.F.A.), Master of Music (Mus.M.), Master of Science (M.S.), Master of Science in Forensic Science (M.S. in Forens.S.), and Doctor of Philosophy (Ph.D.)

SCHOOL OF MEDICINE: Doctor of Medicine (M.D.)

NATIONAL LAW CENTER: Juris Doctor (J.D.), Master of Laws (LL.M.), Master of Comparative Law (M.Comp.L.), Master of Comparative Law (American Practice) (M.Comp.L.(Am.Prac.)), and Doctor of Juridical Science (S.J.D.)

SCHOOL OF ENGINEERING AND APPLIED SCIENCE: Bachelor of Science (Civil Engineering) (B.S. (C.E.)), Bachelor of Science (Electrical Engineering) (B.S. (E.E.)), Bachelor of Science (Measurement Science) (B.S. (Meas.S.)), Bachelor of Science (Mechanical Engineering) (B.S. (M.E.)), Master of Science (M.S.), Master of Engineering Administration (M.E.A.), and Doctor of Science (D.Sc.)

SCHOOL OF EDUCATION: Bachelor of Arts in Education (B.A. in Ed.), Bachelor of Science in Physical Education (B.S. in P.E.), Master of Arts in Teaching (M.A.T.), Master of Arts in Education (M.A. in Ed.), Education Specialist (Ed.S.), and Doctor of Education (Ed.D.)

SCHOOL OF GOVERNMENT AND BUSINESS ADMINISTRATION: Bachelor of Business Administration (B.B.A.), Bachelor of Science in General Studies (B.S. in Gen.Std.), Master of Arts in Government (M.A. in Govt.), Master of Arts in Health Care Administration (M.A. in H.C.A.), Master of Business Administration (M.B.A.), Master of Public Administration (M.P.A.), Master of Science in Administration (M.S. in Adm.), Master of Urban and Regional Planning (M. of Urb. and Reg.Plan.), Graduate Certificate in Health Care Administration (Grad.Cert. in H.C.A.), Doctor of Business Administration (D.B.A.), and Doctor of Public Administration (D.P.A.)

SCHOOL OF PUBLIC AND INTERNATIONAL AFFAIRS: Bachelor of Arts (B.A.), Certificate of the Institute for Sino-Soviet Studies (Cert. of I.S.S.S.), Master of Arts (M.A.), and Master of Science in International Affairs (M.S. in I.A.)

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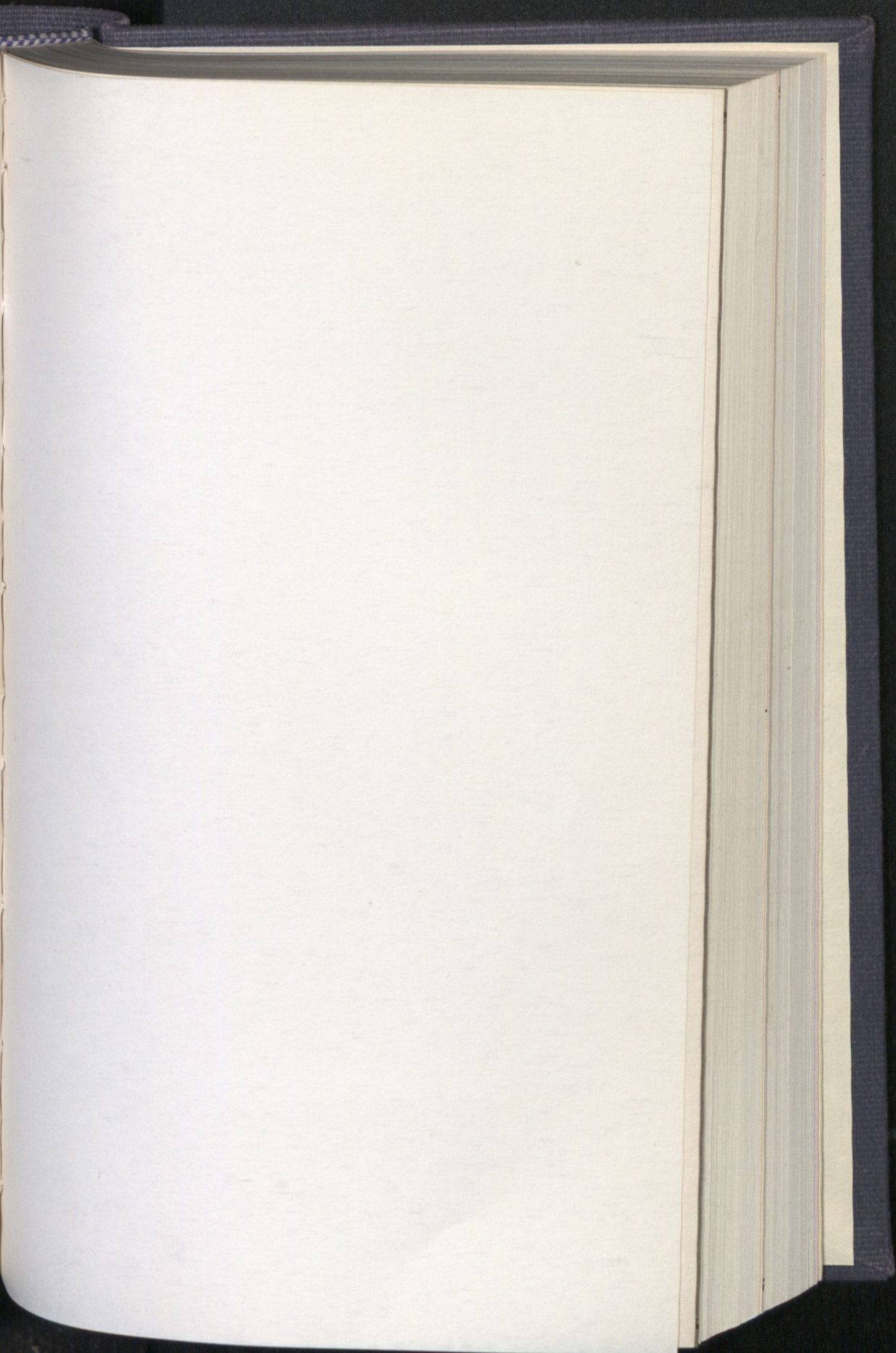
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**THE GEORGE WASHINGTON UNIVERSITY
150TH ANNIVERSARY YEAR**

COLUMBIAN COLLEGE OF ARTS AND SCIENCES, 1821

THE GRADUATE SCHOOL OF ARTS AND SCIENCES, 1893

THE SCHOOL OF MEDICINE, 1825

THE NATIONAL LAW CENTER, 1865

THE SCHOOL OF ENGINEERING AND APPLIED SCIENCE, 1884

THE SCHOOL OF EDUCATION, 1907

THE SCHOOL OF GOVERNMENT AND BUSINESS ADMINISTRATION, 1928

THE SCHOOL OF PUBLIC AND INTERNATIONAL AFFAIRS, 1928

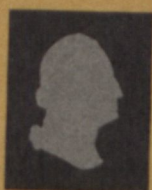
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THE DIVISION OF UNIVERSITY STUDENTS, 1930

THE SUMMER SESSIONS, 1916

THE UNIVERSITY HOSPITAL, 1898

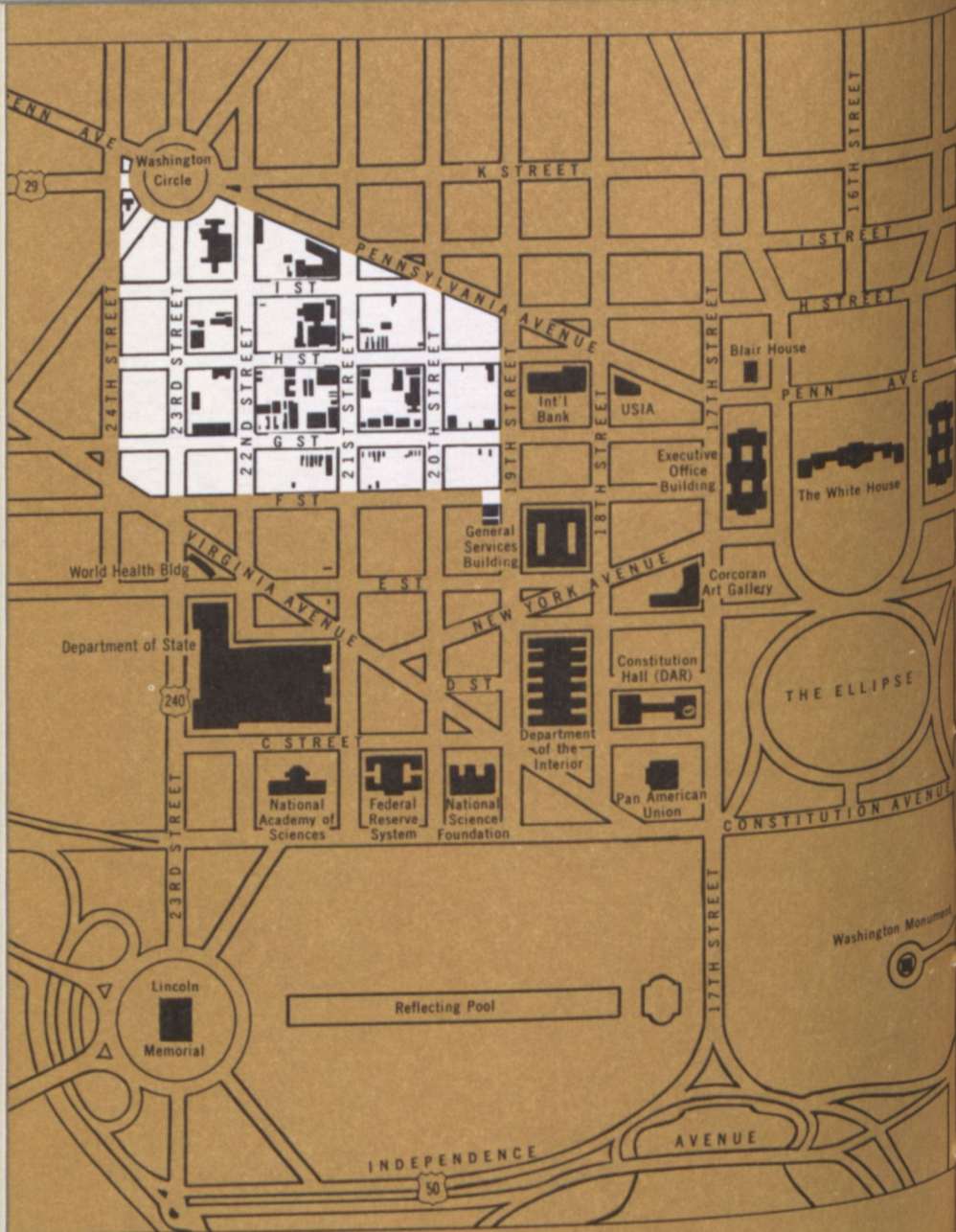
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SUMMER
SESSIONS
CATALOGUE



1970



THE GEORGE WASHINGTON UNIVERSITY CAMPUS / WASHINGTON, D.C.

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THE GEORGE WASHINGTON UNIVERSITY BULLETIN

THE SUMMER SESSIONS 1970

FACTS ABOUT GEORGE WASHINGTON UNIVERSITY

<i>General Information</i>	Private, Nonsectarian, Coeducational, Founded 1821
<i>Location</i>	Washington, D.C., bounded by Pennsylvania Avenue and 19th, F, and 24th Streets, N.W.
<i>Number of Students 1969 Summer Sessions</i>	5,162 (3,150 men, 2,012 women)
<i>Geographical Origin of Students 1969 Summer Sessions</i>	49 states, District of Columbia, 62 foreign countries
<i>Number of Full-time Faculty 1969 Summer Sessions</i>	228
<i>Number of Part-time Faculty 1969 Summer Sessions</i>	96
<i>Students from Other Institutions Enrolled in the 1969 Summer Sessions</i>	348 students from 209 institutions
<i>Residence Hall Rates 1970 Summer Sessions</i>	Multiple occupancy, \$100 a five-week session; single occupancy, \$150 a five-week session (see page 22)

Undergraduate majors: Accounting, American Civilization, Anthropology, Applied Statistics, Art History and Theory, Biology, Botany, Business Administration, Business and Economic Statistics, Chemistry, Chinese Studies, Civil Engineering, Classical Archeology and Greek, Classical Humanities, Dramatic Art, Economics, Electrical Engineering, Elementary Education, Fine Arts, French Language and Literature, Geography, Geology, Germanic Languages and Literatures, History, International Affairs, International Business, Journalism, Latin, Latin American Studies, Literature (English, American), Mathematical Statistics, Mathematics, Measurement Science, Mechanical Engineering, Medical Technology, Music (Applied, History and Literature, Theory), Philosophy, Physical Education, Physics, Political Science, Premedicine, Psychology, Public Affairs, Religion, Russian Language and Literature, Secondary Education, Sociology, Spanish American Literature, Spanish Language and Literature, Speech Communication, Speech Pathology and Audiology, Zoology.

Study leading to graduate or professional degrees is offered in the Graduate School of Arts and Sciences, the National Law Center, the School of Medicine, the School of Engineering and Applied Science, the School of Education, the School of Government and Business Administration, and the School of Public and International Affairs.

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A SUMMER SEMESTER IN THE NATION'S CAPITAL

THE GEORGE WASHINGTON UNIVERSITY offers a two-term summer program which makes it possible for students to earn 14 semester hours of credit during the summer months. The Library, classrooms, and residence hall are air-conditioned. For courses offered at specific times, refer to the hourly schedule on pages at the back of this catalogue. For term dates, see the calendar on pages 5 and 6.

CALENDAR FOR THE 1970 SUMMER SESSIONS

Application for Graduation—An "Application for Graduation" form *must* be filed and the appropriate fee paid at the time of registration for the summer session of the senior or final year. Students completing degree requirements during the Summer Sessions will be awarded diplomas (no formal convocation) September 30, 1970, provided they have completed all degree requirements and have applied for graduation as a part of registration for the Summer Sessions.

COLUMBIAN COLLEGE OF ARTS AND SCIENCES

GRADUATE SCHOOL OF ARTS AND SCIENCES

SCHOOL OF ENGINEERING AND APPLIED SCIENCE

SCHOOL OF GOVERNMENT AND BUSINESS ADMINISTRATION

SCHOOL OF PUBLIC AND INTERNATIONAL AFFAIRS

DIVISION OF UNIVERSITY STUDENTS

First Session

- June 15* Registration for first 5-week session and 8-week courses (10 am-8 pm) *Monday*
- June 16* First 5-week session classes and 8-week courses begin *Tuesday*
- July 3* Holiday *Friday*
- July 21* First 5-week session classes end *Tuesday*
- July 22* First 5-week session examination day *Wednesday*
- August 7* Eight-week courses end *Friday*
- August 26* Master's theses completed in summer due in appropriate Dean's Office *Wednesday*

Second Session

- July 23* Registration for second 5-week session (10 am–7 pm)
Thursday
July 24 Second 5-week session classes begin *Friday*
August 7 Eight-week courses end *Friday*
August 26 Master's theses completed in summer due in appropriate
Dean's Office *Wednesday*
August 27 Second 5-week session classes end *Thursday*
August 28 Second 5-week session examination day *Friday*

NATIONAL LAW CENTER

- June 8* Registration for all sessions (12–7 pm) *Monday*
June 9 First session and 13-week session begin *Tuesday*
July 3 Holiday *Friday*
July 17 First-session classes end *Friday*
**July 20–22* First-session examination period *Monday–Wednesday*
July 23 Registration for students attending 2d session only (2–7 pm)
Thursday
July 24 Second-session classes begin *Friday*
September 2 Last day of classes *Wednesday*
September 3–5 Second session and 13-week session examination period
Thursday–Saturday

SCHOOL OF EDUCATION

- June 15* First 3-week workshop session registration (10 am–8 pm)
Monday
June 16 First 3-week workshop session classes begin *Tuesday*
July 2 First 3-week workshop session classes end *Thursday*
July 3 Holiday *Friday*
July 6 Second 3-week workshop session registration (9 am–6 pm);
classes begin *Monday*
July 6 Six-week session registration (9 am–6 pm); classes begin
Monday
July 6 Ed.D., Ed.S., and M.A. in Ed. July comprehensive exami-
nation applications due *Monday*
July 18 National Teacher Examinations *Saturday*
July 24 Second 3-week workshop session classes end *Friday*
July 25 Ed.D., Ed.S., and M.A. in Ed. comprehensive examinations
Saturday
July 27 Third 3-week workshop session registration (9 am–5 pm);
classes begin *Monday*
August 14 Six-week session and third 3-week workshop session classes
end *Friday*

FALL SEMESTER 1970–71

- September 17–19* Registration—*Thursday–Saturday*

* Classes scheduled Wednesday evenings for the 13-week session will meet on Wednesday, July 22.

THE UNIVERSITY

HISTORY AND ORGANIZATION

THE GEORGE WASHINGTON UNIVERSITY had its beginning in 1821 as The Columbian College in the District of Columbia. The name of the institution was changed in 1873 to Columbian University and in 1904 to The George Washington University. The debt of the University to George Washington, whose name it bears, is an intangible one.

George Washington, as President and as private citizen, had urgently insisted upon the establishment of a National University in the Federal City. There he hoped that, while being instructed in the arts and sciences, students from all parts of the country would acquire the habits of good citizenship, throwing off local prejudices and gaining at first hand a knowledge of the practice, as well as the theory, of republican government. To further the materialization of his hopes, Washington left a bequest of fifty shares of The Potomac Company "towards the endowment of a University to be established within the limits of the District of Columbia, under the auspices of the General Government, if that government should incline to extend a fostering hand towards it." The Congress never extended "a fostering hand." The Potomac Company passed out of existence, and Washington's bequest became worthless.

Fully conscious of Washington's hopes, but motivated primarily by a great missionary urge and the need for a learned clergy, a group of dedicated ministers and laymen sponsored a movement for the establishment of a college in the District of Columbia. Inspired largely by the zeal and energy of the Reverend Luther Rice, they raised funds for the purchase of a site and petitioned Congress for a charter. After much delay and amendment, Congress granted a charter which was approved by President Monroe on February 9, 1821. To safeguard the College's nonsectarian character it provided "that persons of every religious denomination shall be capable of being elected Trustees; nor shall any person, either as President, Professor, Tutor or pupil, be refused admittance into said College, or denied any of the privileges, immunities, or advantages thereof, for or on account of his sentiments in matters of religion."

During the entire time when the institution was known as Columbian College, its activities were centered on College Hill, a tract of forty-six and a half acres between the present Fourteenth and Fifteenth Streets extending north

from Florida Avenue to somewhat beyond Columbia Road. The Medical School was located downtown. For the better part of the Columbian University period, the buildings of the University were situated along H Street between Thirteenth and Fifteenth Streets. The Medical School group still remains there.

During the last half century the University's present plant has been developed in that section of the old First Ward familiarly known as "Foggy Bottom," between Nineteenth and Twenty-fourth Streets, south of Pennsylvania Avenue. Within a few squares are the White House, the Department of the Interior, the State Department, the World Bank, and many other governmental offices and international agencies. The area is not without its reminders of historic interest to the University. President Monroe, who signed the Charter, lived at 2017 Eye Street. The first President of the Board of Trustees, the Reverend Obadiah B. Brown, was for fifty years the pastor of a church at Nineteenth and Eye Streets, and Washington selected Twenty-third and E Streets as the site of the National University he hoped to see established.

The University as it is now organized consists of Columbian College of Arts and Sciences (undergraduate); the Graduate School of Arts and Sciences; the professional schools, which include the National Law Center and the schools of Medicine, Engineering and Applied Science, Education, Government and Business Administration, and Public and International Affairs; the College of General Studies; the Division of University Students; and the Summer Sessions.

The George Washington University is privately endowed and is governed by a self-perpetuating Board of Trustees of which the president is an ex officio member.

ACADEMIC STATUS

The George Washington University is accredited by its regional accrediting agency, the Middle States Association of Colleges and Secondary Schools.

The University is on the approved list of the American Association of University Women and is a member of the College Entrance Examination Board.

The National Law Center is a charter member of the Association of American Law Schools and is approved by the Section of Legal Education and Admissions to the Bar of the American Bar Association. The School of Medicine is a member of the Association of American Medical Colleges and is one of the medical colleges which have been continuously approved by the American Medical Association. Curricula of the School of Engineering and Applied Science in Civil, Electrical, and Mechanical Engineering are accredited by the Engineer's Council for Professional Development. The School of Education is a charter member of the American Association of Colleges for Teacher Education and is accredited by the National Council for Accreditation of Teacher Education. The Department of Chemistry is on the approved list of the American Chemical Society. The School of Government and Business Administration maintains full membership in the Middle Atlantic Association of Colleges of Business Administration, and by invitation, in 1968, the School became a charter academic member of the American Association of Collegiate Schools of Business Assembly. The Programs in Public Accounting designed to prepare students for Certified Public Accountants examinations have been approved by the state boards of New York and Maryland. The program in Hospital Administration has been accredited by the Association of University Programs in Hospital Administration since 1962.

EDUCATIONAL FACILITIES

The University Library.—The University Library contains approximately 494,116 volumes and, with the exception of the law and medical collections, is housed in the Library Building.

Regulations governing the use of the Library, the circulation of books, and the use of reserve books and periodicals are available at the service desks of the Library.

Other Library Facilities in Washington.—The student has access also to the Library of Congress, the Public Library of the District of Columbia and its branches, the Library of the Pan American Union, the Library of the Bureau of Railway Economics, the Library of the United States Department of Agriculture, the Library of the United States Office of Education, the National Library of Medicine, the Library of the Smithsonian Institution, and many other great special collections of the government departments.

Research Facilities of Washington.—The arrangement of the summer schedule of classes permits the full-time student to avail himself of the opportunity to study, at first hand, the working of the Federal Government and so to form a background for intelligent and useful citizenship.

In the departmental libraries of the Federal Government are a multitude of reports made by eminent specialists in all fields of science on the results of study and research in the bureaus, experimental stations, laboratories, museums, and observatories of the Nation.

In addition to the governmental collections the student has available the research facilities of such scientific and educational groups, whose headquarters are situated in Washington, as the Carnegie Institution, the American Council on Education, the National Academy of Sciences, the National Research Council, the National Education Association, and the National Geographic Society.

CONSORTIUM OF UNIVERSITIES OF THE WASHINGTON METROPOLITAN AREA, INC.

Five universities in Washington, D.C.—American University, Catholic University of America, *George Washington University*, Georgetown University, and Howard University—have formed a Consortium through which they are coordinating the use of their respective facilities. As the arrangement develops, juniors, seniors, and graduate students in approved programs leading to degrees in any one of the universities will increasingly have the opportunity to select from the combined offerings of all five universities the particular courses which best meet their needs.

Participation is limited to campus degree candidates. The following, however, are excluded: freshman and sophomore students, and students in Canon Law, Law, Dentistry, Medicine, and Theology.

Special courses, such as private instruction (as in music or art) or tutorial study and courses in preparation for passing the language requirement, are excluded from the Consortium program. Also excluded are courses offered in Reserve Officer Training Corps programs. *A student may not take courses at another university that are available at his own.*

The student registers and pays at his own university for all Consortium courses. There are no refunds for Consortium courses in the summer.

See page 16 for information concerning registration for Consortium courses.

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William Parkhurst Smith, Jr., B.A., M.B.A., *Vice President for Student Affairs*

Frederick Russell Houser, M.A., *Registrar*

Joseph Young Ruth, B.A., *Director of Admissions*

THE COLLEGES, SCHOOLS, AND DIVISIONS

Calvin Darlington Linton, Ph.D., *Dean of Columbian College of Arts and Sciences*

Arthur Edward Burns, Ph.D., *Dean of the Graduate School of Arts and Sciences*

John Parks, M.S., M.D., *Dean of the Medical Center*

Robert Kramer, B.A., LL.B., *Dean of the National Law Center*

Harold Liebowitz, D.Ae.E., *Dean of the School of Engineering and Applied Science*

Rodney Tillman, Ed.D., *Dean of the School of Education*

James Carlton Dockeray, Ph.D., *Dean of the School of Government and Business Administration*

Burton Malcolm Sapin, Ph.D., *Dean of the School of Public and International Affairs*

Eugene Ross Magruder, M.B.A., Ph.D., *Dean of the College of General Studies*

John Gage Allee, Jr., Ph.D., *Dean of the Division of University Students*

Charles William Cole, Ph.D., *Dean of the Summer Sessions*

George Martin Koehl, M.A., *Associate Dean of Columbian College of Arts and Sciences*

James Joseph Feffer, B.A., M.D., *Associate Dean of the Medical Center, for Clinical Affairs*

Angus MacIvor Griffin, Ph.D., *Associate Dean of the Medical Center, for Administration and Planning*

Clarence Alfred Lowe, B.A., Ed.M., *Associate Dean of the Medical Center, for Research*

- Frank Nelson Miller, Jr., B.S., M.D., *Associate Dean of the Medical Center, for Student and Curricular Affairs*
- William Wallace Kirkpatrick, B.A., LL.B., *Associate Dean of the National Law Center*
- Ralph Clarke Nash, Jr., B.A., J.D., *Associate Dean of the National Law Center, for Graduate Studies, Research, and Projects*
- Edward Andrew Potts, B.A., LL.B., *Associate Dean of the National Law Center*
- Calvin Trexler Klopp, B.A., M.D., *Medical Director of the University Clinic*
- Victor Frederick Ludewig, B.S., *Administrator of the University Hospital and Clinic*
- Joseph Louis Métivier, Jr., M.A., *Assistant Dean of Columbian College of Arts and Sciences*
- Robert Clinton Rutledge, Ph.D., *Assistant Dean of Columbian College of Arts and Sciences*
- Harry Elwood Yeide, Jr., Ph.D., *Assistant Dean of Columbian College of Arts and Sciences*
- William Francis Edward Long, Ph.D., *Assistant Dean of the Graduate School of Arts and Sciences*
- Galip Mehmet Arkilic, Ph.D., *Acting Assistant Dean of the School of Engineering and Applied Science*
- Robert Edward Baker, M.A., Ed.D., *Assistant Dean of the School of Education*
- Blake Smith Root, Ed.D., *Assistant Dean of the School of Education*
- Jean Marie Gladding, M.A., *Acting Assistant Dean of the Division of University Students*
- Lawrence Winkler, M.A., Ed.D., *Assistant Dean of the Summer Sessions*

THE SUMMER SESSIONS

THE PROGRAMS OF THE SUMMER SESSIONS have been planned to meet the needs of full- and part-time students.

During the summer of 1970, Columbian College of Arts and Sciences, the Graduate School of Arts and Sciences, the School of Engineering and Applied Science, the School of Government and Business Administration, the School of Public and International Affairs, and the Division of University Students offer courses in two 5-week sessions, with some graduate seminars and courses extending over an 8-week period. The School of Engineering and Applied Science also offers courses in an 8-week period. The National Law Center offers courses in three sessions, and the School of Education offers courses in a 6-week session and three 3-week workshop sessions.

The time at which each course is offered (session and hours) is stated at the end of the course description. For the convenience of the student an hourly schedule of classes, arranged by session, appears on pages 98-103.

Admission

APPLICATION FOR ADMISSION OR READMISSION

THE APPLICATION FOR ADMISSION to degree candidacy should be accompanied by a \$25 application fee. There is no application fee for the student who is applying for nondegree status in the Division of University Students.

NONDEGREE STATUS

Application for nondegree status in the Division of University Students should be received, with any required credentials, by the Friday before the registration date of the session for which admission is sought (see Calendar, pages 5 and 6).

DEGREE CANDIDACY

Students from secondary schools wishing to begin college as degree candidates, in either the first or second term of the summer session, must submit application and all required credentials prior to March 1.

Undergraduate transfer students from other institutions, applicants for graduate programs, and readmission applicants must submit application and required credentials prior to May 1 for the first summer session and June 1 for the second summer session.

For admission to the National Law Center, see pages 27-28.

Records presented become the property of the University and *cannot* be returned.

APPLICATION FORMS

The tearout postcard form inside the back cover of this catalogue may be used to request the Dean of the Summer Sessions to furnish the appropriate form for admission or readmission to the University for nondegree status or for a degree program. Students who attended the University in the spring semester of 1970 do not need to reapply to attend the Summer Sessions.

THE STUDENT NOT SEEKING A DEGREE

The student not seeking a degree from this University should complete application for admission to the Division of University Students. (See paragraph above.) This nondegree-granting division makes the work of the University available to five types of applicants, in accordance with the following requirements:

1. The student registered for a degree at another institution is admitted to the extent that facilities permit. No transcript of record is required unless the student has been subject to academic or disciplinary action.*
2. The student over 21 years of age who is not working for a degree in this or another institution may be admitted to take courses for which he has adequate preparation, as determined by the department concerned. A transcript of record is not usually required.*
3. Secondary school applicants under 21 years of age who have not attended a college or higher institution may be admitted if they meet the entrance requirements of Columbian College of Arts and Sciences (see pages 24-25).
4. Under special conditions, secondary school applicants under 21 years of age who have been accepted by a regionally accredited university or college for the fall semester of 1970 may be admitted for the *summer session only* without filing a transcript if they submit a photostatic copy of their letter of unconditional acceptance.
5. Secondary school students applying for admission to the Secondary School Honors Program may be admitted in accordance with the requirements stated on pages 39-40.

THE STUDENT SEEKING A DEGREE

An applicant from a secondary school must

1. Send to his high school principal the high school record form provided by the University, with the request that the completed form be mailed to the *Office of Admissions*.

* For admission to the Division of University Students the student must be in good standing and eligible to continue in the institution last attended during the past calendar year. No student is eligible for admission if he has been suspended within the past calendar year.

2. Request a report of College Entrance Examination Board test scores be sent to the Office of Admissions directly from the Educational Testing Service, Princeton, N.J., or Berkeley, Calif. Every applicant is required to submit scores on the Scholastic Aptitude Test and the English Composition Achievement Test. In addition, an Engineering applicant must take the Mathematics Test (Level I or II).

An applicant who has attended one or more institutions of higher learning must request each registrar to mail to the Office of Admissions a transcript of his record, even though credits were not earned. An honorable dismissal is required from the institution last attended.

The report of the Graduate Record Examination, the Miller Analogies Test, or the Admission Test for Graduate Study in Business, where applicable, should accompany application to graduate degree candidacy.

Registration

A STUDENT MAY NOT REGISTER FOR CLASSES until admission to the University has been approved by the appropriate office.

A student previously registered in this University who was not registered for campus courses during the spring semester preceding this registration must apply for and receive a letter of readmission from the Office of Admissions (undergraduate and nondegree) or appropriate Dean's Office (graduate), before he is eligible for registration.

Registration days and hours are stated in the calendar at the front of this catalogue. All students except those in the National Law Center should report first to the first floor of the University Library, 2023 G Street, N.W., where they will be given materials and detailed information concerning registration procedures. Degree candidates in Law secure their registration packets and instructions at the Office of the Dean of the National Law Center in Stockton Hall.

Registration packets for all students (except those in the National Law Center) registering on June 15 and July 23 will be distributed from the University Library, 2023 G Street, N.W. On all other registration dates (Law excluded), packets will be distributed from the Office of the Registrar, Rice Hall, 2121 Eye Street, N.W.

Students planning to take courses in the first session and also in other sessions later in the summer may register at the first registration for *all* summer courses. Students who wish to register for the second five-week session, the second session in Law, or the second three-week, the six-week, or the third three-week session in Education may register on the stated registration dates for those sessions or on any earlier summer registration date (see Summer Sessions Calendar, pages 5-6). Tuition for all courses is due and payable in full at the time of registration.

Students expecting to complete requirements for degrees during the Summer Sessions must apply for graduation as a part of registration for the Summer Sessions and pay the appropriate fee.

In special instances, with the permission of the instructor, a person who has been admitted to the University may be registered as an auditor in a class without being required to take active part in the exercises or to pass examinations. No academic credit will be allowed for such attendance. A student who takes a course as an auditor may not take the same course later for credit.

Summer Law students planning to take the New York Bar examination must register for both sessions, complete both, and carry a program of at least ten class periods a week (if day students) and at least eight class periods a week (if evening students).

REGISTRATION BY GW STUDENTS FOR CONSORTIUM COURSES

Students interested in taking courses at any of the four other universities in the Consortium of Universities of the Washington Metropolitan Area, Inc. (see page 9), should consult the program announcements of the other universities. Consortium application forms and instructions are available from the Registrar after the student has obtained his registration packet.

In order to participate in the Consortium program (1) the graduate student obtain the approval of his adviser and should ascertain from the department of the university where the course is taught whether or not he is eligible for the course and whether there is space in the class, or (2) the undergraduate student must obtain the approval of his adviser and *must* ascertain from the department of the university where the course is taught whether or not he is eligible for the course and whether there is space in the class. Specific inquiries should be addressed to the Registrar.

CHANGES IN PROGRAM OF STUDY

Changes in programs of study may be made only with the permission of the adviser or major professor and the dean or director of the college, school, or division concerned.

Students should consult the deans' offices concerning final dates on which changes in schedule may be made.

Fees and Financial Regulations

THE FOLLOWING FEES have been adopted for the summer of 1970:

Tuition Fees

For each semester hour* (except for work taken by candidates for the degree of Doctor of Juridical Science and all other Doctoral candidates in residence in the University prior to the 1967 Summer Sessions).....	\$68.00
Doctor of Juridical Science, including the final examination.....	1,900.00

* Candidates for doctoral degrees (except for the degree of Doctor of Juridical Science) in residence in the University prior to the 1967 Summer Sessions may complete their programs under the schedule for payment of tuition fees in effect prior to July 1, 1967. For tuition fee for the degree of Doctor of Juridical Science, see above.

University Center Fee (charged all students registered on campus*, non-refundable)

For each semester hour for which the student registers..... \$3.50

Additional Course Fees

In certain courses additional fees, such as laboratory and material fees, are charged as indicated in the course descriptions. These fees are due with the tuition fee for the course. Breakage of apparatus is charged against the individual student. When breakage is in excess of the normal amount provided for in the laboratory fee, the individual student will be required to pay such additional charges as are determined by the department concerned.

Graduation Fees

Associate in Arts.....	10.00
Bachelor's, Master's, Education Specialist, and Doctor's degrees.....	25.00
Certificate of the Institute for Sino-Soviet Studies, Graduate Certificate in Health Care Administration.....	25.00

Fee for Binding Master's Thesis.....	10.00
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Fee for Microfilm Service and Printing Abstract of Doctoral Dissertation	55.00
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Special Fees

Application fee (degree candidate) nonrefundable.....	25.00
Application fee, Unclassified Students in the National Law Center, non-refundable	5.00
Admission tests (when required).....	6.00-12.00
Late-registration fee, for failure to register within the designated period.....	15.00
Reinstatement fee, for reinstatement after financial suspension for nonpayment of fees.....	15.00
Returned check fee, charged a student whose check is returned because of insufficient funds or improper drafting.....	15.00
For each examination to qualify for advanced standing and for each special examination	5.00
English test for foreign students (when required).....	5.00
Laboratory check-out fee, for failure to check out of chemistry laboratory by the date deadline set by the instructor.....	3.00
National Teacher Examinations fee, for Bachelor of Arts in Education degree candidates.....	9.00-13.00
Transcript fee, for each transcript of record.....	1.00

Registration on campus in the University entitles each student to the following University privileges: (1) the services of the Student Career Services Office; (2) the use of the University Library; (3) medical attention and hospital services described on pages 19-20. These privileges terminate when the student withdraws or is dismissed from the University.

*The maximum charge for any student during the entire Summer Sessions will be \$37.50. Students at the College of General Studies are charged the University Center Fee only when registered for courses on campus.

PAYMENT OF FEES

No student is permitted to complete registration or to attend classes until all fees are paid. Fees for each session are due in advance at the time of registration.

An auditor pays all fees chargeable to the student registered for credit.

WITHDRAWALS AND REFUNDS

Registrations are for the session, and no refunds or rebates are allowed; this regulation also applies to courses taken through the Consortium of Universities of the Washington Metropolitan Area, Inc. In no case will tuition be refunded because of absence from classes.

Payments apply only to the session for which registration charges are incurred, and in no case will these payments be credited to another session or term.

Students in chemistry who fail to check out of the laboratory on or before the date set by the instructor, unless excused by the instructor, will be charged a \$3 check-out fee. A student who drops a course before the end of the session must check out of the laboratory at the next regular laboratory period.

Authorization to withdraw and certification for work done will not be given a student who has not a clear financial record.

University Regulations

STUDENTS IN THE SUMMER SESSIONS are subject to the University regulations governing students enrolled during the academic year. Degree candidates are referred to the catalogues of the schools in which they are registered. Non-degree students should consult the *Undergraduate and Graduate Catalogue*.

Academic Credit.—The Summer Sessions are an integral part of the University. Academic credit for completed work will be given toward the appropriate degrees in the various colleges and schools of the University in accordance with their separate regulations and requirements.

Residence.—Summer Sessions work may be counted in residence but the candidate for a degree must satisfy the residence requirements of the school or college concerned.

Academic Work Load.—No full-time student may take more than 7 semester hours of work during each 5-week session. No student employed more than 20 hours a week may take more than 4 semester hours of work during each 5-week session.

In the School of Education, 3 semester hours constitutes a full-time program for full-time students in any one of the 3-week workshop sessions, and 6 semester hours represents full-time work in the 6-week session.

In the National Law Center the maximum amount of work that may be taken in each session by a full-time student is 6 semester hours; by an employed student, 4 semester hours.

In the School of Engineering and Applied Science the maximum amount of work that may be taken in a session by a full-time student is 6 semester hours.

The right is reserved by the University to dismiss or exclude any student from the University, or from any class or classes, whenever, in the interest of the student or the University, the University Administration deems it advisable to do so.

The University and its various colleges, schools, and divisions reserve the right to modify or change requirements, rules, and fees. Such regulations shall go into force whenever the proper authorities may determine.

The University is not responsible for the loss of personal property in any University building. A "Lost and Found" office is maintained in the University Security Office, Woodhull House, 2033 G Street, N.W.

UNIVERSITY POLICY ON THE RELEASE OF STUDENT INFORMATION

In general, the policy of the University is one of attempting to keep the student's record confidential and out of the hands of those who would use it for other than legitimate reasons. At the same time, the policy must be flexible enough not to hinder the student, the University, or the community in their legitimate endeavors.

No information concerning a student will be released, except as noted below, unless required by court order or subpoena, or requested in writing by the student:

1. Information which is of public record, such as whether or not the student is currently enrolled; dates of attendance; whether or not he received a degree; current address and telephone number; the school or college in which he is enrolled.

2. The issuance of formal transcripts of record to recognized institutions of higher learning; the certification of academic achievement to the various recognized professional associations (law, medicine, engineering, education, etc.); and the inspection of records, under appropriate supervision, by properly validated representatives of government investigative agencies.

RECENTLY ESTABLISHED REGULATIONS

An Appendix (pages 104-5) contains regulations recently approved by the University's Board of Trustees.

Student Services and Activities

HEALTH SERVICES

THE HEALTH SERVICES STAFF assists students with their medical needs by advice and treatment, by proper referral when necessary, and by cooperation with other physicians. For medical emergencies and health consultations there is, on the campus, a Student Health Clinic open Monday through Friday, from 9 a.m. to 5 p.m., with physician in attendance. On Saturdays, a physician is available from 9 a.m. until 12 noon. For night and weekend emergencies, students may go to the emergency room of the University Hospital for treatment. The basic fee for this visit will be paid by the Health Services, and all other charges will be the responsibility of the student. This arrangement is for emergency care only.

Medical privileges also include hospitalization, including board and nursing, in the University Hospital for not more than one week during any twelve-month period—the necessity to be determined by the Director of Health Services*. These privileges do not include coverage for maternity or other conditions arising from a pregnancy. All additional hospital charges for operating room, anesthetics, laboratory, X-ray, medications, or any special services must be paid by the student. Expenses incurred for examinations and treatment by specialists, such as eye refraction and provision of glasses, orthopedic examinations and application of cast or other appliance, laboratory and X-ray work, and surgical operations, must be paid by the student.

These medical benefits apply only to illness or disability incurred while currently enrolled in the University. They do not apply to illness or disability incurred between the last day of examinations for a semester or summer session and completion of registration for the next semester or summer session.

The student may, if he so desires, engage physicians and nurses of his own choice, but when he does so he will be responsible for the fees charged.

Rules: (1) the Director of Health Services is empowered to limit or deny the medical benefits when, in his discretion, a student has, by his misconduct or breach of the rules of the University, made himself ineligible; (2) the Director of Health Services has authority to determine the necessity and length of hospitalization; (3) a student not currently enrolled or one who has severed his connection with the University is ineligible for medical benefits; (4) a student intending to train for an athletic team is required to pass a thorough examination; (5) the hospitalization privilege provided by the University is not available to those students covered by any other type of hospitalization.

The University is not responsible for injuries received in intercollegiate or intramural games, or in any of the activities of the departments of Physical Education.

THE READING CENTER

The Reading Center offers individual diagnostic and corrective services for all levels: primary, elementary, secondary, and adult. In addition, special reading improvement classes are conducted for high school and college students as well as other adults.

A complete diagnosis includes psychological tests; vision, hearing, dominance, and spelling tests; and various types of reading achievement and aptitude tests. Results are interpreted, and a written report is presented in conference with the parents or the individual.

The special reading improvement classes for high school students, college students, and other adults are offered throughout the year at stated intervals. Emphasis is placed on improvement of vocabulary, speed, comprehension, and study skills. Instruction in spelling is also provided as needed. Mechanical aids such as the tachistoscope, rate accelerator, and controlled reader are available for increasing speed of comprehension.

Fees.—The fee for individual diagnosis is \$60; for individual instruction, \$8 a lesson; for semi-individual instruction, \$6 a lesson; for instruction in small groups with common reading difficulties, \$5 a lesson. Fees are reduced for full-time students currently enrolled in George Washington University.

All fees are payable in advance at the Office of the Cashier.

* See rule (5) for exception.

PSYCHOLOGICAL CLINIC

The George Washington University Psychological Clinic offers services which are available primarily to students enrolled in the University.

The services are designed to assist individuals in the evaluation of their educational, personal, and social lives; diagnose academic difficulties and provide remedial measures such as study-habits instruction and programmed instruction; and refer individuals to qualified agencies for assistance with problems not handled by the Clinic. Behavior therapy, individual and group psychotherapy, and individual and group counseling are available.

The Clinic also provides special assessments, including diagnostic measures prescribed by the School of Engineering and Applied Science, admissions tests for the University and for other selected educational institutions, and some selected assessments for business and industry.

Fees.—For students who are currently registered as degree candidates in the University, the fee is \$20; for students currently enrolled in the University but not as degree candidates, \$60; for graduates of the University, \$60; for community clients, \$85. Fees for specialized testing are dependent upon the services involved. All fees are payable at the Office of the Clinic.

THE SPEECH AND HEARING CLINIC

The Speech and Hearing Clinic offers diagnostic and remedial work for children and adults with such communication difficulties as stuttering, lisping, cleft palate speech, cerebral-palsied speech, and voice, articulatory, and hearing problems. Diagnostic and remedial work is also available for persons with nonstandard language usage due to such conditions as hearing loss, brain damage, mental retardation, and environmental factors.

Fees.—The fee for an initial evaluation is \$20. Fees for additional specialized testing are dependent on the testing involved. The fees for individual speech or hearing therapy range from \$3 to \$10 a session. Fees are reduced for full-time students enrolled in the University and for persons receiving group therapy. Fees are payable at the Office of the Cashier.

VETERANS EDUCATION

The Office of the Registrar assists students entitled to educational benefits as veterans or war orphans with any problems which may arise concerning their benefits. This Office also processes certification of enrollment and attendance to the Veterans Administration so that monthly allowances will be paid.

When feasible, students entitled to benefits as veterans or war orphans should consult the Office of the Registrar prior to submitting application to the Veterans Administration. All such students should obtain the instruction sheet issued by the Office of the Registrar, which sets forth requirements to be fulfilled before certification of enrollment can be made to the Veterans Administration, and which includes other information of general interest.

The Veterans Administration is at 2033 M Street, N.W., Washington, D.C. 20421.

RESIDENCE HALL

Men, women, and married couples (no children) will be housed in Thurston Residence Hall, 1900 F Street, N.W. This is a modern, air-conditioned building.

Admission to the University does not include a room reservation. A separate application for a room should be made well in advance.

RESIDENCE HALL RATES FOR 1970 SUMMER SESSIONS*

	Multiple Occupancy	Single Occupancy
Monthly	\$80.00	\$120.00
Weekly	20.00	30.00
Daily	3.00	5.00
Each regular 5-week Session.....	100.00	150.00

Residence hall payments are due and payable in advance. A student who fails to meet payment is subject to automatic suspension.

Forms for application, together with detailed information, may be obtained from the Housing Administrator.

Information concerning off-campus housing near the University is available at the Office of the Housing Administrator.

UNIVERSITY CENTER

The term University Center encompasses a building, an organization, and a program. The building is the University's center for community life. It is the physical instrument for implementation of the programs and objectives of the organization.

The organization, composed of students, faculty, administrators, and alumni, provides an informal education medium for individual and group activities adapted to the leisure-time interests and needs of the college community. It also provides training for those directly involved in management and programming for the Center.

The primary purpose of the George Washington University Center is the continuing development of a broad cultural, intellectual, social, and recreational program. Its secondary purpose is the provision of its various services and facilities to the campus community for the development of community life.

The Center houses a wide range of facilities to serve the needs of the campus, including dining rooms and a rathskeller, a bookstore, lounges and study areas, a theater, bowling lanes and a billiard room, a faculty club, student organization offices and workrooms, meeting and conference rooms, an information center, music listening rooms, social areas, shower and dressing rooms, lockers, and parking accommodations.

STUDENT AND ALUMNI CAREER SERVICES OFFICE

The Student and Alumni Career Services Office provides assistance to degree candidates and alumni seeking full-time, part-time, temporary, or permanent employment.

The Office maintains a registry of positions available in many fields, both locally and nationally, and refers qualified applicants for consideration. The Office administers the On-Campus Industrial and Government Recruitment Interview Program for seniors and graduate students, in which private companies, government agencies, service organizations, public school systems, and

* The rates include linen service. Rates shown are subject to change.

universities participate. The Office also handles the referral and placement functions of the on-campus College Work-Study Program. Prospective teachers may establish permanent credentials files in the Student and Alumni Career Services Office. This service includes files for alumni seeking college and university faculty and administrative positions. The Office also provides individual counseling for students and alumni wishing career guidance.

The Office is open from 9:00 a.m. to 5:00 p.m., Monday through Friday.

SOCIAL AND RECREATIONAL PROGRAM

The social and recreational program includes many varied activities and scheduled events. In addition to this campus program a great abundance of cultural as well as social and recreational opportunities is available to persons living in the metropolitan area. During the summer the University posts a weekly guide to all these on a bulletin board in the University Center.

THE COLLEGES, SCHOOLS, AND DIVISIONS

INFORMATION CONCERNING SPECIFIC REQUIREMENTS for degrees is omitted from this catalogue. For such information, the student is referred to the catalogue of the school concerned.

COLUMBIAN COLLEGE OF ARTS AND SCIENCES

Incoming liberal arts and science freshmen and all transfer students of less than junior class standing are registered in the lower division of Columbian College of Arts and Sciences. The lower division also provides the first two years of the prelegal and premedical programs; the preprofessional work required for admission to the School of Education, the School of Government and Business Administration, and the School of Public and International Affairs; and a terminal curriculum in Accounting. The lower division is primarily concerned with providing (1) the personal and academic guidance needed by beginning college students and (2) the broad cultural foundations in language and literature, science, and social studies on which major field specialization in the upper division is built.

The upper division of Columbian College offers programs leading to Bachelor's degrees in the liberal arts and sciences.

THE DEGREES

Columbian College offers work leading to the following degrees: Associate in Arts, Bachelor of Arts, and Bachelor of Science. In cooperation with the School of Medicine, Columbian College offers work leading to the combined degrees of Bachelor of Arts and Doctor of Medicine. In cooperation with the Department of Pathology and the University Hospital, Columbian College offers work leading to the degree of Bachelor of Science in Medical Technology.

ENTRANCE REQUIREMENTS*

Requirements for admission to the freshman class are as follows:

1. An acceptable certificate of graduation from an accredited secondary school, showing at least fifteen units which must include four years of English; at least two years of one foreign language; two years of science, preferably with laboratory instruction; two years of social studies, one of which must be American history; and two years of college preparatory mathematics. It is to be

* Entrance requirements are established by the faculties of the several colleges, schools, and divisions.

The Office of Admissions, as agent for the faculties, administers regulations governing admission, readmission, and transfer.

noted that one unit of algebra, or the equivalent, is prerequisite to courses in chemistry and statistics, and that one unit in algebra and one unit in plane geometry, or the equivalent, are prerequisite to courses in mathematics and physics.

2. The principal's statement that the applicant is prepared to undertake college work.

3. College Entrance Examination Board scores, which must be submitted on the Scholastic Aptitude Test and the English Composition Achievement Test.

A person who does not present all of the formal requirements stated above may request the Office of Admissions to present his case to the Columbian College Committee on Admission and Advanced Standing. The Committee may prescribe appropriate tests.

The applicant is responsible for

a. Sending the report form obtained from the Office of Admissions to his high school principal who will complete the form and forward it directly to the Office of Admissions.

b. Requesting a report of scores on the Scholastic Aptitude Test and the English Composition Achievement Test to be sent to the Office of Admissions by the Educational Testing Service, 20 Nassau Street, Princeton, N.J. 08540, or 1947 Center Street, Berkeley, Calif. 94704.

MAJOR FIELDS

Curricula leading to the degree of Bachelor of Arts are available in the following major fields:

American Civilization
Anthropology
Applied Statistics
Art History and Theory
Biology
Botany
Chemistry
Classical Archeology and Greek
Classical Humanities
Dramatic Art
Economics
Fine Arts
French Language and Literature
Geography
Geology
Germanic Languages and Literatures
History
Journalism
Latin
Latin American Studies

Literature:
English
American
Mathematical Statistics
Mathematics
Music:
Music History and Literature
Music Theory
Applied Music
Philosophy
Physics
Political Science
Psychology
Religion
Russian Language and Literature
Sociology
Spanish American Literature
Spanish Language and Literature
Speech Communication
Speech Pathology and Audiology
Zoology

Curricula leading to the degree of Bachelor of Science are available in the following major fields:

Applied Statistics
Biology
Botany
Chemistry
Geology
Mathematical Statistics
Mathematics
Physics
Zoology

THE GRADUATE SCHOOL OF ARTS AND SCIENCES

The Graduate School offers work leading to the following degrees: Master of Arts, Master of Fine Arts, Master of Music, Master of Science, Master of Science in Forensic Science, and Doctor of Philosophy. In cooperation with the School of Medicine, the Graduate School offers work leading to the combined degrees of Master of Science and Doctor of Medicine.

ENTRANCE REQUIREMENTS

The entering graduate student must have an approved Bachelor's degree from an accredited higher institution, an appropriate distribution of courses, and a superior quality of work in the major field.

GRADUATE FIELDS

Subject	Degrees Offered
I. Humanities	
American Civilization	M.A. Ph.D.
American Literature	M.A. Ph.D.
Art:	M.F.A.
Ceramics	
Graphics	
Painting	
Sculpture	
Art History and Theory	M.A.
Dramatic Art	M.F.A.
English Literature	M.A. Ph.D.
French Language and Literature	M.A. Ph.D.
Germanic Languages and Literatures	M.A.
Linguistics	M.A.
Museology	Mus.M.
Music:	
Applied Music	
Conducting	
Music Composition	
Music Theory	
Musicology	M.A.
Philosophy	M.A.
Religion	M.A.
Religious Education	M.A.
Russian Language and Literature	M.A. Ph.D.
Spanish American Literature	M.A. Ph.D.
Spanish Language and Literature	
II. Social Sciences	
Anthropology	M.A. Ph.D.
Economics	M.A.
Geography	M.A. Ph.D.
History	M.A. Ph.D.
*International Relations	

* The School of Public and International Affairs offers a Master of Arts field in International Affairs.

Latin American Studies	M.A.
Political Science	M.A. Ph.D.
Sociology	M.A. Ph.D.

III. Physical and Mathematical Sciences

Applied Statistics	M.S.
Chemistry	M.S. Ph.D.
Forensic Science	M.S. in Forens.S.
Geochemistry	M.S. Ph.D.
Geology	M.A., M.S. Ph.D.
Mathematical Statistics	M.A. Ph.D.
Mathematics	M.A. Ph.D.
Physics	M.A. Ph.D.

IV. Biomedical and Related Sciences

Anatomy	M.S. Ph.D.
Biochemistry	M.S. Ph.D.
*Biological Sciences	M.S. Ph.D.
Biophysics	M.S. Ph.D.
Genetics	Ph.D.
Human Ecology	M.S. Ph.D.
Microbiology	Ph.D.
Mycology	M.S. Ph.D.
Pathology	M.S.
Pharmacology	M.S. Ph.D.
Physiology	M.S. Ph.D.
Psychology	M.S. Ph.D.
Speech Pathology and Audiology	M.A. Ph.D.
	M.A.

THE NATIONAL LAW CENTER

The National Law Center offers work leading to the degrees of Juris Doctor, Master of Laws, Master of Comparative Law, Master of Comparative Law (American Practice), and Doctor of Juridical Science.

Forms for application for admission may be obtained from the Office of the Dean of the National Law Center, 720 Twentieth Street, N.W., Washington, D.C. 20006.

Applications should be accompanied by an application fee of \$25 for a degree candidate, \$5 for an Unclassified Student. Two recent signed photographs must accompany the application for a degree candidate.

See "Registration," pages 15-16, for provisions applicable to students who plan to take the New York Bar examination.

ENTRANCE REQUIREMENTS

For Unclassified Students.—Two types of students may be admitted to the National Law Center as Unclassified Students, in accordance with the following requirements:

1. A candidate for a Bachelor of Laws or Juris Doctor degree with an above-average record at another law school which is a member of the Association of American Law Schools or is approved by the American Bar Association, may,

*Biology, Botany, and Zoology.

at the discretion of the Dean, be admitted as an Unclassified Student to earn credits for transfer to the other law school.

2. Graduates of law schools which are members of the Association of American Law Schools or are approved by the American Bar Association may be admitted to take advanced courses without pursuing degree programs. Applicants with inferior records will not be admitted.

Unclassified Students participate in the work of the course, take examinations, and have their grades recorded. Credit earned as an Unclassified Student may be credited toward Master's and Doctor of Juridical Science degrees at this institution if the student transfers to degree status.

For the Degree of Juris Doctor.—Students from other law schools which are members of the Association of American Law Schools or are approved by the American Bar Association may apply for transfer to this Law Center with advanced standing. *No beginning students are admitted as candidates for the degree of Juris Doctor in the summer term.*

For the Degree of Master of Laws.—A Bachelor's degree from an accredited college or university* and a Bachelor of Laws or Juris Doctor degree from a law school which is a member of the Association of American Law Schools or is approved by the American Bar Association are required. The applicant must demonstrate (by a *B* average or equivalent performance measure, high class standing, *Law Review* experience, positions held, or professional achievements) that he is capable of Master's level work. Advanced standing is not granted for credits earned while the student was a candidate for the first degree in law.

For the Degree of Master of Comparative Law and Master of Comparative Law (American Practice).—The following are required: (1) the successful completion of and graduation from a course in arts, philosophy, letters, or sciences, equivalent to graduation from a gymnasium, lycee, or liceo; and (2) graduation in law from a recognized foreign university.

For the Degree of Doctor of Juridical Science.—The following are required: a Bachelor of Arts or equivalent degree from an approved college or university*; a Bachelor of Laws or Juris Doctor degree, earned with high rank, from a law school which is a member of the Association of American Law Schools or is approved by the American Bar Association; outstanding capacity for scholarly work in the field of law; and faculty approval of the applicant's dissertation topic. The applicant must submit an outline of his proposed topic in some detail, indicating by chapter and division within chapter the exact scope of the project. There should be a bibliography for each chapter listing books, reports, cases, and *Law Review* articles to be considered. Although the outline cannot predict every detail of the subsequent research, it must be sufficiently definite to afford the faculty a basis for evaluation.

Continuing Legal Education Students.—A simplified admission and registration procedure is used for members of the bar who wish to take courses on a noncredit basis.

THE SCHOOL OF ENGINEERING AND APPLIED SCIENCE

The School of Engineering and Applied Science offers courses leading to the degree of Bachelor of Science in the following areas: Civil Engineering, Elec-

* The Dean is authorized to make exceptions in appropriate cases.

trical Engineering, Measurement Science, and Mechanical Engineering. Graduate programs lead to the degrees of Master of Science, Master of Engineering Administration, and Doctor of Science.

ENTRANCE REQUIREMENTS FOR THE BACHELOR OF SCIENCE DEGREE

The School admits those applicants who can benefit themselves and society by disciplined intellectual effort in its environment.

Admission is the first selective step in a long series of qualifying steps the student will take in his progress toward professional competence in engineering. It indicates the School's belief that the applicant has at least the minimum preparation and ability to complete the curriculum successfully.

The applicant must be of good character and must have an academic background appropriate for the program of studies contemplated.

Consideration for admission is based on the following:

1. An acceptable certificate of graduation from an accredited high school showing at least fifteen units*;
2. The principal's statement that the applicant is prepared to undertake college work;
3. Scores on the following College Entrance Examination Board tests: the Scholastic Aptitude Test, the English Composition Achievement Test; and a Level I (Standard) or Level II (Intensive) Mathematics Test—Level I preferred.

The qualifications of applicants who, because of unusual circumstances, do not meet the above requirements will be considered by the School, which may prescribe admission tests.

Nine and one-half of the fifteen units required for entrance must be distributed as follows: three in English, two in algebra, one in plane geometry, one-half in plane trigonometry, one in physics or chemistry, and two in one foreign language or history. General science may not be counted in satisfaction of the science requirement but may be counted as an elective unit.

It is recommended that *both* physics and chemistry be studied in high school. A high school course in solid geometry is recommended as a firm foundation for college mathematics.

An applicant must arrange to have sent directly from his school to the Office of Admissions of the University the academic record of his first seven terms in secondary school, together with a personal evaluation and recommendation from his principal. This information may be supplied on a form provided by the University or on a standard form used by the secondary school provided all essential information is included.

Quantitative Deficiency.—A graduate of an approved high school who lacks not more than two units of the required subjects and who presents fifteen acceptable units may be admitted to a prescribed program which includes courses to make up his deficiencies.

ENTRANCE REQUIREMENTS FOR THE MASTER'S DEGREES

Admission to graduate study toward a Master's degree requires an appropriate Bachelor's degree from a recognized institution and evidence of capacity for

* A unit represents a year's study in a secondary school subject, including in the aggregate not less than 120 sixty-minute periods of prepared classroom work.

productive work in the field selected, as indicated by undergraduate grades, Graduate Record Examination scores, and similar data.

An applicant who has significant deficiencies in preparation may be required to take prescribed undergraduate courses as an unclassified student before being admitted to graduate student status. In some cases, if such deficiencies are minimal, he may be admitted to graduate student status and allowed to take a limited number of graduate courses while completing the undergraduate courses in which he is deficient. In no case may the undergraduate courses thus taken fulfill any part of the requirements for the Master's degree.

ENTRANCE REQUIREMENTS FOR THE DOCTOR'S DEGREE

The applicant must have adequate preparation for advanced study, including a satisfactory Master's degree, or the equivalent, together with acceptable personal qualities and a capacity for creative scholarship. Well in advance of the opening of the semester for which the student seeks admission, he should correspond with and preferably have a personal interview with the Dean or department chairman of his proposed field of study, to discuss the University's facilities for guidance in this field, the applicant's qualifications, and the possibilities of an effective doctoral program.

THE SCHOOL OF EDUCATION

The School of Education prepares teachers, counselors, and administrators for the higher ranges of educational service and offers opportunities to teachers of experience to extend their education. The schedule of courses is arranged to meet the needs of employed students as well as those able to devote full time to their studies. Students pursuing programs involving teacher certification must make provision to student-teach in the fall or spring semester during hours when public schools are in session. The School offers both graduate and undergraduate work.

THE DEGREES

The School of Education offers work leading to the following degrees: Bachelor of Arts in Education, Bachelor of Science in Physical Education, Master of Arts in Education, Master of Arts in Teaching, Education Specialist, and Doctor of Education.

ENTRANCE REQUIREMENTS

For the Bachelor's Degrees.—The satisfactory completion of two years of approved college work, or graduation from an approved two-year college, or the equivalent, is required.

For the Degree of Master of Arts in Education.—A Bachelor's degree from an accredited college, or the equivalent, a score on a required aptitude examination, and the approval of the Committee on Admission and Advanced Standing are required.

For the Degree of Master of Arts in Teaching.—To be admitted as a student-intern, an applicant must (1) have a Bachelor's degree from an accredited liberal arts institution, including courses related to the general education require-

ments for teacher certification; (2) show evidence of interest in children and a sincere desire to teach; (3) submit three written references attesting to quality of academic record and personality; (4) submit a score on the Aptitude Test of the Graduate Record Examination or the Miller Analogies Test; and (5) be interviewed by the University Selection Committee, or under arrangements specified by the Committee and approved by the Dean of the School of Education.

For the Degree of Education Specialist.—The degree of Master of Arts in Education from this University, or the equivalent; a satisfactory score on the Miller Analogies Test or the Graduate Record Examination; and two years of successful pertinent experience are required. Each applicant must be interviewed and recommended by a staff member of the School of Education or by a representative in the candidate's locality appointed by the Dean.

For the Doctor's Degree.—The applicant must have adequate preparation for advanced study, including graduate work in fields prerequisite to his objective equivalent to that required for the degree of Master of Arts in Education at this University, at least three years of successful pertinent educational experience, acceptable personal qualities, and capacity for creative scholarship and effective leadership.

THE SCHOOL OF GOVERNMENT AND BUSINESS ADMINISTRATION

The School of Government and Business Administration offers work leading to the following degrees: (1) Bachelor of Business Administration with a major in Accounting, Business Administration, Business and Economic Statistics, or International Business; (2) Master of Arts in Government in the fields of Business and Economic Statistics, Personnel Administration, Public Administration, or Urban and Regional Planning; (3) Master of Arts in Health Care Administration; (4) Master of Business Administration in the fields of Accounting, Business Administration, Health Care Administration, International Business, or Personnel Administration; (5) Master of Public Administration in the fields of Health Care Administration, Personnel Administration, Public Administration, or Urban and Regional Planning; (6) Master of Urban and Regional Planning; (7) Graduate Certificate in Health Care Administration (post-Master's study); (8) Doctor of Business Administration; and (9) Doctor of Public Administration.

ENTRANCE REQUIREMENTS FOR THE BACHELOR'S DEGREE

Bachelor of Business Administration.—The satisfactory completion of the Accounting, Business Administration, and International Business, or the Business and Economic Statistics curriculum in the lower division of Columbian College of Arts and Sciences, or the equivalent, is required.

ENTRANCE REQUIREMENTS FOR THE MASTER'S DEGREES

A Bachelor's degree from an accredited college or university, with a quality-point index of 3.00 (B average) in the relevant undergraduate field, is required.

Applicants for admission to all Master's degree programs are required to take either the Admission Test for Graduate Study in Business or the aptitude sections of the Graduate Record Examination, both of which are administered by the Educational Testing Service. Master of Business Administration applicants must submit scores on the Admission Test for Graduate Study in Business; Master of Arts in Government, Master of Arts in Health Care Administration, Master of Public Administration, or Master of Urban and Regional Planning applicants may submit scores on either the Admission Test for Graduate Study in Business or the Graduate Record Examination. Any test scores submitted must have been earned within three years of the date of application.

ENTRANCE REQUIREMENTS FOR THE DOCTOR'S DEGREES

Doctor of Business Administration.—The degree of Master of Business Administration, Master of Arts in an approved field, or the equivalent, together with acceptable personal qualities and a capacity for creative scholarship, is required. Applicants must file results of the Admission Test for Graduate Study in Business administered by the Educational Testing Service.

Doctor of Public Administration.—The degree of Master of Public Administration, Master of Arts in an approved field, or the equivalent, together with acceptable personal qualities and a capacity for creative scholarship, is required. Applicants must file results on either the Admission Test for Graduate Study in Business or the aptitude sections of the Graduate Record Examination administered by the Educational Testing Service.

THE SCHOOL OF PUBLIC AND INTERNATIONAL AFFAIRS

The School of Public and International Affairs offers work leading to the degrees of Bachelor of Arts with a major in International Affairs, Chinese Studies, or Public Affairs, Master of Arts in the field of International Affairs, Public Affairs, or Russian Studies, and the Certificate of the Institute for Sino-Soviet Studies.

ENTRANCE REQUIREMENTS FOR THE BACHELOR OF ARTS DEGREE

With a major in International Affairs, Chinese Studies, or Public Affairs.—The satisfactory completion of the appropriate curriculum in the lower division of Columbian College of Arts and Sciences, or the equivalent, is required.

ENTRANCE REQUIREMENTS FOR THE MASTER OF ARTS DEGREE

A Bachelor's degree from an accredited college or university is required. Students admitted to candidacy must have attained a *B* average or equivalent in the relevant undergraduate fields.

In the field of International Affairs.—The applicant's undergraduate program should include background courses corresponding to an undergraduate major in international affairs at this University.

In the field of Public Affairs.—An undergraduate major in public affairs, economics, history, or political science, depending on the field of specialization, is required.

In the field of Russian Studies.—The applicant's undergraduate program should include appropriate background courses in history, political science, and Russian language.

THE COLLEGE OF GENERAL STUDIES

The College of General Studies administers the off-campus degree programs over which Columbian College of Arts and Sciences, the School of Government and Business Administration, and the School of Public and International Affairs have degree-granting authority.

The College also offers credit courses in liberal arts, education, and business administration for which there is sufficient demand. Special programs are offered to meet the in-service needs of specified groups.

As a community service, a regular program of noncredit courses without entrance requirements is also offered.

Columbian College of Arts and Sciences has academic jurisdiction over programs leading to the degrees of Bachelor of General Studies (areas of concentration in history, mathematics, political science, and psychology); Bachelor of Science in Environmental Health; Bachelor of Science in Geodetic and Cartographic Science; and Bachelor of Science in Oceanography.

The School of Government and Business Administration has academic jurisdiction over programs leading to the degrees of Bachelor of Science in General Studies (areas of concentration in accounting and business administration), and Master of Science in Administration.

ENTRANCE REQUIREMENTS

Off-campus Credit Courses.—A simplified procedure is used for admission and registration in off-campus courses. Transcripts of previous academic work are not required. Registration is restricted to those whose qualifications would indicate that they are able to carry the course successfully. Registration in an off-campus course does not constitute admission to degree candidacy in the University.

Noncredit Courses.—In general, noncredit courses will be open to any individual interested in enrolling. When a noncredit course is organized at the request of some particular agency or group, admission may be restricted to the students recommended by the sponsoring organization. A limit on the size of classes may have to be imposed in order to maintain the quality of instruction.

The separate catalogue of the College of General Studies, available at the College, 706 Twentieth Street, N.W., Washington, D.C. 20006, contains full information concerning programs, courses, entrance and degree requirements, and fees.

THE DIVISION OF UNIVERSITY STUDENTS

The Division of University Students makes the work of the University, in its several colleges and schools, accessible to five types of students who are not working toward a degree in this University (see page 14).

SPECIAL PROGRAMS AND WORKSHOPS

THE SUMMER SESSIONS is pleased to announce a carefully planned group of special programs and workshops devised to serve a variety of student needs and to utilize resources which are uniquely present at the University and in the Nation's Capital. These programs, which are described below, have been developed in the area of the humanities and in the area of social studies. They all have a strong academic orientation and will be taught by the regular faculty of the University or distinguished visitors from other institutions.

American Studies

THIS PROGRAM will be devoted to cross-cultural study of the United States and Canada (First Session) and of the United States and Europe (Second Session).

Professor Russell B. Nye is Distinguished Professor of English at Michigan State University. He received his B.A. degree from Oberlin College and his M.A. and Ph.D. degrees from the University of Wisconsin. He received the Pulitzer and Knopf prizes for his *George Bancroft: Brahmin Rebel*, and is author of nine other books in American cultural history, all characterized by fine scholarship and an engaging style of writing, including biographies of William Lloyd Garrison and Benjamin Franklin, a book on midwestern progressivism, and an admirable description of *The Cultural Life of the New Nation: 1776-1830*. He is past president of the national American Studies Association. Professor Nye is a member of the joint committee of the Canadian Historical Association and the American Historical Association, and has been guest lecturer at Queens University and the University of Ottawa. He will teach a course during the First Session on "Canada and the United States."

Professor J.E. Morpurgo, co-author with Professor Nye of the *Pelican History of the United States*, will teach a course during the Second Session on "America and Europe." With Bertrand Russell, Perry Miller, and others, he wrote *The Impact of America on European Culture*. He has written and edited a number of books on the English Romantics, as well as books and articles on

English and American cultural history. He has been a visiting lecturer in the United States, Canada, Great Britain, and Germany; is Director General of the National Book League; and contributes regularly to the "Times Literary Supplement" and to the British Broadcasting Corporation. He recently served as Professor of American Literature at the University of Geneva and holds Britain's senior chair of American Literature at the University of Leeds. At George Washington, in addition to his course on "America and Europe," Professor Morpurgo will also teach English 234, a graduate course on the study of London Romantic writers (see page 67).

FIRST SESSION—JUNE 15 TO JULY 22

AMERICAN CIVILIZATION

181 *Canada and the United States* (3)

Nye

Introduction to a comparative study of Canada and the United States, focused on selected issues and subjects in related fields of interest. Materials from various disciplines, with emphasis on historical, literary, and cultural topics. MTWThF 1:10-2:30 pm.

SECOND SESSION—JULY 23 TO AUGUST 28

AMERICAN CIVILIZATION

182 *America and Europe* (3)

Morpurgo

Investigation of contradictory influences. From colonial times, America has been for Europe at once the lodestar of aspirations and a prime example of disrupted civilization. Europe has been to some Americans a model or lure and to others a symbol of decay. This complex, two-way emulation and rejection is studied from the time of Franklin and Benjamin West to that of Hollywood, the Blues, and the Beatles. MTWThF 1:10-2:30 pm.

Communist Affairs

THE INSTITUTE FOR SINO-SOVIET STUDIES is again offering a program of related courses focused on the theory of communism and its political operation in Eastern Europe and Asia. These courses are broad enough to have general appeal as electives for the liberal arts student and sufficiently specific to have vocational utility for the teacher of social studies. Regular faculty members will offer nine courses in this program, six in the first session and three in the second. Each course carries 3 semester hours of credit. Students majoring in Political Science should consult with their advisers before registering for this work.

The following faculty will staff the courses in this program:

Franz Michael, *Professor of International Affairs and Far Eastern History*

William R. Johnson, *Associate Professor of History*

Charles F. Elliott, *Associate Professor of Political Science and International Affairs*

Carl A. Linden, *Associate Professorial Lecturer in Political Science*

Richard C. Thornton, *Assistant Professor of History*

FIRST SESSION—JUNE 15 TO JULY 22

HISTORY

- 138 **History of World Communism** (3) Thornton
The international communist movement from its beginnings to the present. MTWThF 4:10–5:30 pm.
- 387 **Readings in the History of Sino-Soviet Relations** (3) Thornton
MWF 6:10–8:00 pm.

POLITICAL SCIENCE

- 101 **Far East in the Modern World** (3) Michael
General character of Far Eastern societies and their response to the impact of America, Europe, and Russia; American policy in Far East and influence of world communism. MTWThF 8:10–9:30 am.
- 160 **Modern Communist Ideologies** (3) Elliott
Intensive study of 20th century communism; emphasis on its antecedents and possible evolution. Backgrounds, careers, and ideas of leading communist figures: Marx, Lenin, Stalin, Khrushchev, and Mao. MTWThF 4:10–5:30 pm.
- *161 **Soviet Government and Politics** (3) Linden
Analysis of influences in the formation of the Soviet system under Lenin, Stalin, and Khrushchev; the Soviet Communist Party; government and mass organizations; selected aspects of economic, cultural, social, and foreign policy. MTWTh 7:35–9:15 pm.
- 163 **Soviet Foreign Policy** (3) Elliott
Relations with United States, Third World, China; international communism; disarmament policy; instruments of foreign policy; interrelationships of domestic and foreign policies; ideology and foreign policy. MTWTh 5:45–7:25 pm.
- 194 **Governments of China and Japan** (3) Michael
Institutions and processes of government in contemporary China and Japan, with some historical background. Attention to ideological forces. Students cannot receive credit for both P Sc 194 and 162. MTWThF 9:40–11 am.

SECOND SESSION—JULY 23 TO AUGUST 28

HISTORY

- 187 **History of Modern China** (3) Johnson
China since 1840, particular attention to political developments. MT
WThF 4:10–5:30 pm.
- 396 **Readings in Modern Far Eastern History** (3) Johnson
MWF 6:10–8 pm.

* PSc 112, 115, and 161 are related in their subject matter, and credit for only one of the three may be applied toward a degree.

Dance Workshop

JUNE 15 TO JULY 2*

THE DEPARTMENT OF PHYSICAL EDUCATION is offering a three-week Modern Dance Workshop under the direction of Professor Elizabeth Burtner. Advanced courses will be taught by a guest-artist teacher. At the conclusion of the workshop, student compositions and repertory will be presented in the University's theater. This coeducational program is open both to graduate and undergraduate students with previous experience in dance technique and a background in dance composition. From 1 to 3 semester hours of credit may be earned or courses may be audited. Graduate credit in the program may be arranged.

Additional information may be obtained from Professor Elizabeth Burtner, Building J, George Washington University.

PHYSICAL EDUCATION

57 Dance Technique I (1)

Intermediate technique in modern dance. MTWThF 9-10:30 am.

58 Dance Technique II (1)

Advanced technique in modern dance. MTWThF 9-10:30 am.

110 Dance Composition II (1)

Advanced problems in composition. May be repeated once for credit. MTWThF 11 am-12:30 pm.

120 Repertory (1)

Study and performance of dance works. Admission by permission of instructor. May be repeated once for credit. MTWThF 2-3:30 pm.

Forensics Workshops for High School Teachers

THE DEPARTMENT OF SPEECH AND DRAMA, in cooperation with the Georgetown University Summer Forensics Institute, will offer three workshops in forensics for high school teachers, under the direction of Associate Professor Herbert L. James of Dartmouth College and Associate Professor William M. Reynolds of George Washington University. The first two workshops will focus on techniques and methods of training the student advocate; the third will explore in depth the 1970-71 National High School questions. These workshops are designed to meet the needs of inexperienced coaches as well as those of more experienced teachers. Opportunity will be provided to observe and practice-teach in the Georgetown Institute. Co-founders and present co-directors of the highly successful Georgetown Institute, Professors James and Reynolds are nationally prominent in the fields of speech and debate.

The first two workshops may be taken for credit as Sp&D 123 and 124, or in a noncredit status. The third workshop is noncredit only. A descriptive brochure is available by writing to Professor George F. Henigan, Chairman,

*Classes begin on the day of registration.

Department of Speech and Drama, George Washington University. (Students wishing to enroll for credit should also request an Application for Admission form.)

JUNE 22 TO JULY 2

SPEECH AND DRAMA

123 Training the Student Advocate: Special Events (2)

Intensive study in the techniques and methods of preparing students for responsible speaking in public or contests. Workshop emphasizes the logical, motivational, and ethical demands of oratory, extempore and interpretative speaking, and student congress. MTWThF 9:40 am-12:30 pm.

JULY 6 TO JULY 24

SPEECH AND DRAMA

124 Training the Student Advocate: Debate (3)

In-depth investigation into the theory and practice of coaching high school debate with special attention to preparing students for competition. MTWThF 9:40 am-12:30 pm.

NONCREDIT WORKSHOPS

Students electing noncredit status will register in the Department of Speech and Drama and pay the fee of \$53.50 a week (includes University Center fee) directly to the Department. Admission to the University is not required.

JUNE 22 TO JULY 2

Training the Student Advocate: Special Events

Intensive study in the techniques and methods of preparing students for responsible speaking in public or contests. Workshop emphasizes the logical, motivational, and ethical demands of oratory, extempore and interpretative speaking, and student congress. MTWThF 9:40 am-12:30 pm.

JULY 6 TO JULY 24

Training the Student Advocate: Debate

In-depth investigation into the theory and practice of coaching high school debate with special attention on preparing students for competition. MTWThF 9:40 am-12:30 pm.

JULY 27 TO AUGUST 14

Workshop on the National High School Proposition

Comprehensive study of bibliography, analysis, and casing, utilizing the unique research facilities of the nation's capital—libraries, government agencies, and independent research organizations in addition to lectures on the topic by outstanding authorities in the field. Special individual work in developing approaches and cases for use in the Fall of 1970. MTWThF 9:40 am-12:30 pm.

Language Study in Paris

JULY 21 TO SEPTEMBER 2

THE GEORGE WASHINGTON UNIVERSITY, in conjunction with the American College in Paris, offers this summer a six and one-half week language program in Paris led by a member of the Department of Romance Languages and Literatures. The program will include intensive training in grammar, composition, and conversation, and a series of lectures on French culture and civilization. The program will begin with a five-day tour of parts of France, followed by five weeks of classes in intensive language study at the American College.

Prerequisite: one year of college French with grades of *B* or better.

Detailed information concerning admission to this program should be obtained from the office of Assistant Dean Joseph L. Métivier, Jr., Monroe Hall, George Washington University.

AMERICAN COLLEGE COURSES

Intensive French (5)

Elementary, intermediate, or advanced French—18 hours per week. Language practice—5 hours a week.

French Culture and Civilization (1)

Lectures on French history, literature, and civilization. Visits to museums and places of historical and cultural interest in and around Paris.

Secondary School Honors Program

THE OUTSTANDING SECONDARY SCHOOL STUDENT who wishes to enrich his academic background and participate in a stimulating introduction to college work is encouraged to seek admission to George Washington University's Secondary School Honors Program. The Honors Student is enrolled in regular college courses of his own choosing appropriate to his level of study, his background, and his aptitude as determined through consultation with his high school counselors and advisers at the University.

Since dormitory life is a vital part of the stimulating academic and cultural atmosphere of the campus and community, Honors Students normally live in Thurston Hall, a modern, air-conditioned residence dormitory. Students from the immediate metropolitan area may commute, but they are encouraged to reside in the dormitory. Honors Students living in the dormitory are supervised by well-trained resident counselors. A varied extracurricular program focusing upon the unique location of the University in the Nation's Capital has been planned to complement both the academic and social life of the campus.

Credit earned in the Program is applicable toward a degree at George Washington University should the student later matriculate here. The transfer of credit elsewhere depends upon the policies of the individual school to which the student might later apply.

All students admitted to the Program are appointed Scholars in the Secondary School Honors Program and receive scholarships for the five-week session. Resident students receive a scholarship worth approximately \$200 and pay only \$445, covering full tuition, board, and room. Commuting students receive a \$71.50 scholarship for each 3- or 4-hour course. Laboratory fees and cost of books are not included in these scholarships. The Program is designed to include a normal summer session of two courses.

Since the Honors Program is limited to 120 secondary school students, admission is competitive. A transcript of the applicant's grades to date, available test scores, and evidence of emotional and intellectual maturity are criteria for admission.

Application forms and further information may be obtained from Miss Jean M. Gladding, Director of the Secondary School Honors Program, Division of University Students, George Washington University, Washington, D.C. 20006. No applications will be considered after May 1.

Summer Institutes in Mathematics

FIRST SESSION

THE DEPARTMENT OF MATHEMATICS, under a grant from the National Science Foundation, will offer two Summer Institutes for secondary school teachers of culturally deprived children. The first, for teachers who feel that their background in mathematics needs improvement, includes courses in basic concepts of mathematics and algebra from a modern viewpoint. The second, for teachers who wish to prepare themselves for graduate study, offers courses in calculus and finite mathematics. Both institutes are limited to teachers in the District of Columbia public schools.

For further information and application forms, address Assistant Professor Ruth Bari, Director, Summer Institutes in Mathematics, Monroe Hall, George Washington University.

Summer Institute in Speech Pathology and Audiology

JUNE 22 TO JULY 24

THE SPEECH PATHOLOGY AND AUDIOLOGY section of the Department of Speech and Drama is offering a five-week Institute which will consider specific communications problems of the school-age child. The Institute will be divided into two courses of study in Speech Pathology and two in Audiology, running concurrently. The content of these graduate-level courses is designed to enhance the knowledge of professionals in the field of communication disorders by lectures, discussions, and demonstrations of current practices and procedures. Each course will be supplemented with lectures and demonstrations by three nationally known authorities who will discuss a particular phase of the course content. A student may earn up to six semester hours of graduate

credit during this Institute. He may elect to take all six hours in one discipline, or three in each. A prerequisite of three semester hours in the clinical management of speech and/or language disorders is required of those registering for the Speech Pathology course work; and three semester hours of basic principles and procedures in Audiology is required of those registering for the Audiology course work.

A descriptive brochure is available upon request from Lloyd S. Bowling, Director, Summer Institute in Speech Pathology and Audiology, Department of Speech and Drama, George Washington University.

SPEECH AND DRAMA

277 Advanced Clinical Procedures in Speech and Hearing (3) Regnell

Language therapy for school children. Study of speech and language evaluation and therapy procedures in public schools based on modern linguistics concepts. Video-taped demonstrations. MTWTh 1-2:40 pm.

281 Advanced Clinical Audiology (3) Bowling

Principles and methods underlying assessment of auditory disorders; emphasis on bone conduction, masking, and speech intelligibility. Clinical implications, tests, demonstration, and practicum. Laboratory fee, \$7.50. MTWTh 11:10 am-12:50 pm.

291A Seminar: Speech Pathology (3) Fox

A psycholinguistic model for speech and language disorders. Presentation of a psycholinguistic model of communication based on transformational generative grammar theory and its application to the study of normal and abnormal speech and language behavior in children. May be repeated for credit. MTWTh 9:20-11 am.

292 Seminar: Audiology (3) Majerus

Principles and methods underlying identification and assessment of auditory disorders commonly found in hearing-handicapped school children. Methods for speech and language development, speech reading and auditory training of this age group. Video-taped demonstrations. May be repeated for credit. MTWTh 2:50-4:30 pm.

COURSES OF INSTRUCTION

EXPLANATION OF COURSE NUMBERS

COLLEGES AND SCHOOLS OTHER THAN ENGINEERING AND APPLIED SCIENCE

First-group courses.—Courses numbered from 1 to 100 are planned for students in the freshman and sophomore years. With the approval of the adviser and the Dean, they may also be taken by juniors and seniors. In certain instances, they may be taken by graduate students to make up undergraduate deficiencies or as prerequisite to advanced courses, but they may not be taken for graduate credit.

Second-group courses.—Courses numbered from 101 to 200 are planned for students in the junior and senior years. They may be taken for graduate credit only upon the approval of the dean and the instructor at the time of registration. Such approval is granted only with the provision that students must complete additional work in order to receive graduate credit.

Third-group courses.—Courses numbered from 201 to 300 (in the Graduate School of Arts and Sciences, the School of Government and Business Administration, and the School of Public and International Affairs), courses numbered 201 to 400 (in the School of Education) are planned primarily for graduate students. They are open, with the approval of the instructor, to qualified seniors; they are not open to other undergraduates.

Fourth-group courses.—Courses numbered 301 to 400 in the Graduate School of Arts and Sciences are limited to graduate students; but they are primarily for doctoral candidates. Courses numbered 301 to 400 in the School of Government and Business Administration are limited to doctoral students. In the School of Education fourth-group courses, numbered 401 to 500, are limited to graduate students with Master's degrees from accredited institutions.

SCHOOL OF ENGINEERING AND APPLIED SCIENCE

Courses numbered from 1 through 199 are planned for undergraduate credit, although certain courses may be taken for graduate credit when arrangements are approved in advance by the instructor and the Dean. Courses numbered 201 to 300 are planned for graduate credit and may in certain instances be taken by qualified undergraduate students. Courses numbered from 301 to 400 are primarily for doctoral students.

SEMESTER HOURS OF CREDIT

The number of semester hours of credit given for the satisfactory completion of a course is in most cases indicated in parentheses after the name of the course.

KEY TO ABBREVIATIONS

The following abbreviations are used in this catalogue for course designations.

Acct	Accounting	Germ	Germanic Languages and Literatures
AmCv	American Civilization	HCA	Health Care Administration
Anth	Anthropology	Hist	History
Ap S	Applied Science	Jour	Journalism
B Sc	Biological Sciences	Math	Mathematics
B Ad	Business Administration	ME	Mechanical Engineering
B&PA	Business and Public Administration	Mus	Music
Chem	Chemistry	Phil	Philosophy
Chin	Chinese Language and Literature	P E	Physical Education
CE	Civil Engineering	Phys	Physics
Clas	Classics	P Sc	Political Science
Econ	Economics	Psyc	Psychology
Educ	Education	P Ad	Public Administration
EE	Electrical Engineering	Rel	Religion
E Ad	Engineering Administration	Slav	Slavic Languages and Literatures
EM	Engineering Mechanics	Soc	Sociology
Engl	English	Span	Spanish
Fren	French	S Ed	Special Education
Geog	Geography and Regional Science	Sp&D	Speech and Drama
Geol	Geology	Stat	Statistics
		U&RP	Urban and Regional Planning

The Schedule of Classes for the Summer Sessions, which will be available in April at the Office of the Registrar, will contain information about room assignments and instructors for courses.

The University reserves the right to change or withdraw any of the following courses.

Accounting

E.J.B. Lewis, *Chairman*

1-2 Introductory Accounting (3-3)

Preparation, uses, and limitations of financial reports. Acct 1: basic financial reporting concepts and data accumulation and processing. Acct 2: introduction to managerial accounting—financial programming, cost determination, and analysis of financial statements. Acct 1 is prerequisite to Acct 2. First Session: Acct 1; Second Session: Acct 2. Section A—MTWThF 9:40-11 am; Section B—MTWThF 6-7:20 pm.

***115 Survey of Accounting (3)**

Preparation, uses, and limitations of financial information in the management process. Not open for credit to accounting majors. First Session: Section A—MWF 6–8:25 pm. Second Session: Section C—MWF 6–8:25 pm.

121 Intermediate Accounting (3)

Accounting for assets and liabilities. Prerequisite: Acct 1–2 or permission of instructor. First Session: MTWThF 6–7:20 pm.

171 Auditing (3)

Duties and responsibilities of auditors: principles and procedures of making audits, techniques of verifying financial-statement items, preparation of audit working papers and reports. Prerequisite: Acct 121–22. First Session: MTWTh 5:45–7:25 pm.

193 Business Budgeting (3)

Principles, techniques, and procedures involved in the development, installation, and operation of a system of budgetary control to aid in the management of commercial and industrial organizations. Prerequisite: Acct 1–2. First Session: MTWThF 6–7:20 pm.

†215 Survey of Managerial Accounting (3)

Nature, preparation, analysis, and interpretation of accounting reports; cost accounting, business budgeting, and internal accounting controls and their use in the management process. Not open for credit to graduate students in accounting. Prerequisite: Acct 1–2 or 115. First Session: Section A—MWF 8:10–10 pm. Second Session: Section B—MWF 6:10–8 pm.

297 Accounting Reading and Research (3)

May be repeated once for credit. Both sessions.

299 Thesis Seminar (3)

First Session: MWF 8:10–10 pm.

300 Thesis Research (3)

Second Session.

American Civilization

Administered by the American Studies Program, R.H. Walker, *Director*

161 Studies in American Literature (3)

Same as English 161. Major factors in the national cultural tradition as shown by outstanding writers. Recommended for juniors who are majoring in American Civilization. Prerequisite: Engl 51–52 or 71–72. First Session: MTWThF 11:10 am–12:30 pm.

* A special section of this course, Acct 115B, for students in the Navy Graduate Financial Management Program, will be offered June 8 to July 31; hours to be arranged.
 † A special section of this course, Acct 215C, for students in the Navy Graduate Financial Management Program, will be offered August 3 to September 4.

181 Canada and the United States (3)

First Session: MTWThF 1:10–2:30 pm. (See American Studies program, pages 34–35.)

182 America and Europe (3)

Second Session: MTWThF 1:10–2:30 pm. (See American Studies program, pages 34–35.)

Anthropology

R.K. Lewis, *Chairman*

Departmental prerequisite: Anth 1–2 is prerequisite to all other courses in Anthropology

1–2 Introductory Anthropology (3–3)

Anth 1: survey of man's origin, physical evolution, and culture history.
 Anth 2: survey of the world's cultures, illustrating the principles of cultural behavior. First Session: Anth 1; Second Session: Anth 2. MTWThF 9:40–11 am.

155 Primitive Religion (3)

Conceptions of the supernatural in nonliterate societies. Examination of religious beliefs and practices. Second Session: MTWThF 11:10 am–12:30 pm.

170 Cultures of the Caribbean (3)

Study of the culture history and ways of life of Indian groups of the area during the ethnographic present. First Session: MTWThF 11:10 am–12:30 pm.

295 Research (3)

May be repeated for credit. Both sessions.

299–300 Thesis Research (3–3)

Both sessions.

Applied Science

Alfred Freudenthal, *Acting Chairman*

EIGHT-WEEK COURSES—JUNE 16 TO AUGUST 7

59 Introductory Analytical Mechanics (4)

Kinematics of a particle, statics and dynamics of a particle, statics and dynamics of systems of particles, kinematics of a rigid body, geometrical and inertial parameters of rigid bodies, statics and dynamics of rigid bodies, introduction to Lagrangian-Hamiltonian formulation. Prerequisite: Phys 31. Prerequisite or concurrent registration: Ap S 113. MW 6:10–9:30 pm.

211 Mathematical Methods in Applied Science I (3)

Functions of complex variables and integral transforms: analytic function theory including contour integration and conformal mapping; elements of Fourier and Laplace transforms, special functions, Mellin and Hankel transforms, saddle point methods. Prerequisite: approval of Department. MW 6:10-8:40 pm.

Art

L.P. Leite, *Chairman*

ART HISTORY AND THEORY**1 Art Appreciation (3)**

Language and function of art in its various media; development of styles, aesthetic principles, theories, and the ideas in art through the ages. Primarily for nonmajors. First Session: MTWThF 1:10-2:30 pm.

31-32 Survey of Western Art (3-3)

Survey of the arts in the Western World from prehistoric to modern times. A foundation for further study in the history of art. First Session: Art 31—MTWThF 9:40-11 am; Art 32—MTWThF 8:10-9:30 am.

71-72 Introduction to the Arts in America (3-3)

Painting, sculpture, and architecture of America, with selected references to crafts and popular arts. Art 71: from Colonial beginnings to the Republican Age. Art 72: from early 19th century to the present. First Session: Art 71—MTWThF 11:10 am-12:30 pm. Second Session: Art 72—MTWThF 1:10-2:30 pm.

105 Renaissance Art in Italy II (3)

High Renaissance and Mannerism. am-12:30 pm.

Second Session: MTWThF 11:10 am-12:30 pm.

106 Renaissance Art in the North I (3)

Fifteenth century painting in the Netherlands, Germany, France, Spain, and Portugal. First Session: MTWThF 8:10-9:30 am.

112 Art of Egypt and the Ancient Orient (3)

Study of the art of Mesopotamia, Anatolia, Egypt, and Persia. Session: MTWThF 11:10 am-12:30 pm.

Second

113 Baroque Art in Italy (3)

Development of painting, sculpture, and architecture in 16th and 17th century Italy. First Session: MTWThF 11:10 am-12:30 pm.

114 Baroque Art in the North (3)

Development in painting, sculpture, and architecture in the 16th and 17th centuries in Holland, Flanders, Spain, France, Germany, and England. First Session: MTWThF 9:40-11 am.

119 Pre-Romanesque Art in the North (3)

The Carolingian and Merovingian periods. First Session: MTWThF 1:10-2:30 pm.

147 Pre-Columbian Art (3)

An introduction to pre-Columbian art in Mexico, Central America, and South America from its beginnings to the Spanish conquest. Examination of architecture, sculpture, ceramics, and painting of the great civilizations of the Olmec, Teotihuacan, Maya, Aztec, Chavín, Mochica, and Inca. First Session: MTWTh 7:35-9:15 pm.

148 19th Century American Painting (3)

First Session: MTWThF 4:10-5:30 pm.

***207 Modern Architecture (3)**

Development of modern architecture and building technology in Europe and America from the late 19th century to the present. Second Session: MTWThF 4:10-5:30 pm.

246 Seminar: Classical Art (3)

Second Session: MTWThF 1:10-2:30 pm.

FINE ARTS

Except for Art 137 and 275, Fine Arts courses taught in University studios carry no material or laboratory fees; students must purchase their own materials. Laboratory and material fees for courses taught at the Corcoran School of Art are stated in the course description and are payable at the School. Courses designated CSA are taught at the Corcoran School of Art.

Departmental prerequisite: Art 21-22 or permission of Department Chairman is prerequisite to all other studio courses in Art.

Fine Arts Courses numbered 121 through 281 may be repeated for credit with the approval of the Department.

21-22 Design I: Basic (3-3)

Fundamental studies of principles and elements of design. Art 21: study of two-dimensional design. Art 22: three-dimensional studies. First Session: Art 21A (CSA) and 22A (CSA)—MTWThF 1-4 pm; Art 21B—MTWTh 5:45-7:25 pm; Art 22B—MTWTh 7:35-9:15 pm.

41-42 Drawing I (3-3) CSA

Concepts of drawing: perception, analysis of form, use of media. First Session: Art 41A and 42A—MTWThF 9-12 am; Art 41B and 42B—MTWThF 1-4 pm; Art 41C and 42C—MTWThF 6:30-9:30 pm.

51-52 Ceramics I (3-3) CSA

Basic techniques for clay preparation, hand forming, wheel throwing, and the application of slip glazes and vitreous glazes through workshop and illustrated lectures. Laboratory fee: Art 51, \$45; Art 52, \$45. First Session: Art 51A and 52A—MTWThF 1-4 pm; Art 51B and 52B—MTWThF 6:30-9:30 pm.

* May be taken for undergraduate credit with the approval of the instructor.

61 Water Color (3) CSA

Painting in transparent and opaque water color and in acrylic. Experimentation and new media. First Session: MTWThF 9-12 am.

65-66 Painting I (3-3) CSA

Experimentation with media. Color—theory and analysis. First Session: Art 65A and 66A—MTWThF 9-12 am; Art 65B and 66B—MTWThF 6:30-9:30 pm.

81-82 Sculpture I (3-3) CSA

Three-dimensional design. Basic sculptural techniques; modeling, carving, and construction. Media include wood, clay, stone, plaster. Laboratory fee: Art 81, \$20; Art 82, \$20. First Session: Art 81 and 82—MTWThF 9-12 am.

123 Design III: Individual Problems (3)

Emphasis on the individual student and the problems and materials that specifically interest him in any area of design. Prerequisite: Art 121-22. Second Session: MTWThF 9-12 am.

125-26 Painting II (3-3) CSA

Concepts of painting. Attitudes, approaches, personal statements. First Session: Art 125A and 126A—MTWThF 1-4 pm; Art 125B and 126B—MTWThF 6:30-9:30 pm.

127-28 Painting III (3-3) CSA

Exploration of problems in developing a personal visual imagery. First Session: Art 127A and 128A—MTWThF 1-4 pm; Art 127B and 128B—MTWThF 6:30-9:30 pm.

131-32 Ceramics II (3-3) CSA

Basic techniques in clay and glaze formation, advanced wheel throwing and hand forming. Laboratory fee: Art 131, \$45; Art 132, \$45. First Session: Art 131A and 132A—MTWThF 1-4 pm; Art 131B and 132B—MTWThF 6:30-9:30 pm.

137 Workshop in Materials, Methods, and Techniques (3)

Drawing in charcoal, crayon, and pen; painting and preparation of grounds in tempera, encaustic, fresco buono, oil, watercolor, polymer, and mixed techniques; graphic techniques in woodcut, engraving, etching; modeling in clay and carving in wood and stone; mosaic. Materials and model fee, \$2. First Session: MTWThF 9-12 am.

143-44 Serigraphy (3-3)

Advanced problems in serigraphy; emphasis on its aesthetic possibilities. Prerequisite: Art 57-58. First Session: Art 143—MTWThF 9-12 am; Art 144—MTWThF 1-4 pm.

153 Graphics II (3)

Advanced relief, intaglio, lithographic, and other composite processes. Prerequisite: Art 57-58 or equivalent. Second Session: MTWThF 9-12 am.

157-58 Graphics III (3-3)

Exploration of combined techniques and mixed media. Prerequisite: Art 153-54 or equivalent. First Session: Art 157A (CSA) and 158 (CSA) —MTWThF 9-12 am. Second Session: 157B—MTWThF 1-4 pm.

159-60 Drawing II (3-3) CSA

Development of drawing. Individual study, application and extensions of drawing. First Session: Art 159 and 160—MTWThF 6:30-9:30 pm.

161 Fundamentals of Photography (3) CSA

Study of the fundamental techniques of photography; emphasis on creative expression. Laboratory fee, \$25. First Session: MTWThF 1-4 pm.

171-72 Calligraphy and Lettering (3-3) CSA

Consideration of the basic alphabets and their use in calligraphy, lettering, and typography. First Session: Art 171A—MTWThF 1-4 pm; Art 171B and 172—MTWThF 6:30-9:30 pm.

179-80 Sculpture II (3-3) CSA

Concepts of sculpture. New materials and developments. Laboratory fee: Art 179, \$20; Art 180, \$20. First Session: Art 179 and 180—MTWThF 9-12 am.

189-90 Sculpture III (3-3) CSA

Advanced study concentrating on relevance of scale and media. Relationship of sculpture to the environment. First Session: Art 189 and 190—MTWThF 9-12 am.

191 Advanced Photography (3) CSA

Advanced problems in photography; emphasis on creative expression and individual development. Laboratory fee, \$25. First Session: MTWThF 9-12 am.

231 Design IV (3)

New media and techniques in three-dimensional design. Second Session: MTWThF 1-4 pm.

265-66 Painting IV (3-3) CSA

First Session: Art 265A and 266A—MTWThF 1-4 pm; Art 265B and 266B—MTWThF 6:30-9:30 pm.

275 Painting V (3)

Materials and model fee, \$12. First Session: MTWThF 1-4 pm.

279-80 Sculpture IV (3-3) CSA

First Session: Art 279 and 280—MTWThF 9-12 am.

281 Sculpture V (3) CSA

First Session: MTWThF 9-12 am.

Biological Sciences

A.H. Desmond, *Chairman*

Departmental prerequisite: B Sc 11-12 is prerequisite to all second group courses in Biology, Botany, and Zoology, except by permission of the instructor.

3-4 Introductory Biology for Nonscience Majors (3-3)

Survey of biological principles; emphasis on man as a functional organism in his environment. Material fee, \$10 each session. First Session: B Sc 3; Second Session: B Sc 4. MTW 6-9 pm; Th 6-7 pm.

11-12 Introductory Biology for Science Majors (4-4)

Biological principles and problems designed to furnish a base for advanced studies in biology and related sciences. Material fee, \$10 each session. First Session: B Sc 11; Second Session: B Sc 12. MTWThF 9:40 am-1 pm.

127 Genetics (4)

Introductory course. Basic aspects of transmission of genetic traits with particular reference to the chemical basis of heredity and gene action. Material fee, \$8. First Session: MTWThF 6-8:50 pm.

145 Introduction to Vertebrate Embryology (3)

Origin and early development of the individual, formation of organ systems. Emphasis on the frog, chick, and pig, with reference to the human embryo. Material fee, \$8. Second Session: MTWThF 6-8:50 pm.

148 Histology (4)

Introduction to microscopical anatomy of normal tissues and organs. Material fee, \$8. First Session: MTWThF 9:40 am-1 pm.

171 Undergraduate Research (arr.)

Admission by permission of the staff member concerned. May be repeated for credit. Both sessions.

295 Research (arr.)

Investigation of special problems. May be repeated for credit. Both sessions.

299-300 Thesis Research (3-3)

Both sessions.

Business Administration

P.D. Grub, *Chairman*

51 Introduction to Business (3)

The business environment; structure, activities, and problems of business enterprise; its contribution to society; careers in business. First Session: MTWTh 1:10-2:50 pm.

- 102 Fundamentals of Management (3)**
Planning, organizing, directing, coordinating, and controlling activities of the administrative unit; evolution of management thinking. Second Session: MTWTh 1:10-2:50 pm.
- 105 Personnel Management (3)**
The labor force and labor markets. Industrial personnel and manpower programs, organizations and policy in personnel activities. First Session: MTWTh 5:45-7:25 pm.
- 118 Introduction to Data Processing (3)**
Basic principles and methods of data processing. Introduction to fundamentals, potentials, and problems of automatic data processing as a tool of management. First Session: MTWTh 4:10-5:50 pm.
- 131 Business Finance (3)**
Basic principles involved in the financing of business enterprises. Prerequisite: Acct 1-2. Second Session: MTWTh 3:10-4:50 pm.
- 141 Basic Marketing Management (3)**
Introduction to marketing and marketing management in relation to our total economy and business management, consumer and demand analysis, retailing, wholesaling, major marketing management problems and policies with particular emphasis on major decision areas and tools. Prerequisite: Econ 1-2. First Session: MTWTh 5:45-7:25 pm.
- 161 Commercial Law: Contracts, Sales, Agency, Bailments (3)**
First Session: MTWTh 7:35-9:15 pm.
- 162 Commercial Law: Negotiable Instruments, Property, Mortgages (3)**
Second Session: MTWTh 7:35-9:15 pm.
- 191 Business Reports and Analyses (3)**
Sources of management information, array and analysis of data, interpretation and presentation of findings. Second Session: MTWTh 5:45-7:25 pm.
- 209 Seminar: Personnel Management (3)**
Discussion of industrial personnel and manpower management, and research in advanced problems. Second Session: MWF 8:10-10 pm.
- 231 Financial Decision Making (3)**
Functions and objectives of financial management, asset management, problems of internal financial analysis, rate-of-return analysis, financial forecasting, problems of capital demand and supply. Second Session: MWF 8:10-10 pm.
- 237 Investment Analysis (3)**
Analysis of specific security investments; common and preferred stocks; corporate, government, and revenue bonds; sources of information. Second Session: MWF 6:10-8 pm.
- 241 Advanced Marketing Management (3)**
Marketing management problems and policies in major decision areas of product planning, channels of distribution, advertising, personal selling, sales promotion, pricing, and development of integrated marketing pro-

grams. Tools useful in decision making. Case analysis. First Session:
MWF 6:10-8 pm.

257 Operation of the Multinational Firm (3)

Analysis and discussion of problems in international business by use of the case method, including international market entry and expansion; operating policies, procedures, and problems of multinational companies; developing executives for international business. Prerequisite: advanced Master's standing. First Session: MWTh 6:10-8 pm.

279 Purchasing and Materials Management (3)

(Formerly B Ad 281 Purchasing Principles and Practices)

Industrial purchasing and materials management principles and practices. Organization and functions in materials management. Determination of requirements, source selection, buying practices, policies, and ethics. Second Session: MWF 4:10-6 pm.

283 Pricing and Negotiation (3)

Scope and objectives of negotiated procurement; participation and relationships of functional elements of the organization; preparation, conduct, and recording of negotiations; analysis of contract cost, price, profit, investment, and risk; cost principles; incentives; relationship of contract type to work requirements; techniques of negotiation. First Session:
MWF 4:10-6 pm.

298 Readings in Business (3)

Supervised readings in selected fields within business administration. Admission by permission of instructor. May be repeated once for credit. First Session: MWF 8:10-10 pm.

299 Thesis Seminar (3)

Examination of thesis standards, research philosophy, and methodology. First Session: MWF 8:10-10 pm.

300 Thesis Research (3)

Second Session.

Business and Public Administration

Administered by the Department of Management Science, R.L. Holland,
Chairman

***201 Advanced Administrative Management (3)**

Advanced course in administration emphasizing principles and practices common to administrative units of all kinds. First Session: Section A—MWF 4:10-6 pm; Section B—MWF 8:10-10 pm. Second Session: Section C—MWF 6:10-8 pm.

203 Mathematics for Management (3)

Mathematical concepts employed in the solution of management problems. Applications of analytical geometry, functions, elements of calculus.

* A special section of this course, B&PA 201D, for students in the Navy Graduate Financial Management Program, will be offered August 3 to September 4; hours to be arranged.

and linear algebra to optimization problems. Prerequisite: algebra. First Session: Section A—MWF 4:10–6 pm. Second Session: Section B—MWF 8:10–10 pm.

204 Quantitative Factors in Administration (3)

Survey of quantitative techniques used in the solution of management problems. Potentials and limitations of mathematical models and proper areas for their application. Topics include probability, statistical decision theory, linear programming, waiting line, inventory replacement models. First Session: Section A—MWF 8:10–10 pm. Second Session: Section B—MWF 4:10–6 pm.

207 Human Behavior in Organizations (3)

Individual, group, intergroup, and other human behavior and development; application of social science research to administration. Practical applications emphasized. First Session: Section A—MWF 6:10–8 pm. Second Session: Section B—MWF 8:10–10 pm.

211 Leadership and Executive Development (3)

Theories of managerial leadership; issues and problems associated with leadership in large organizations and at higher management levels; executive selection and development. Prerequisite: B&PA 201 or permission of instructor. Second Session: MWF 6:10–8 pm.

218 Survey of Data Processing (3)

Fundamentals of automatic data processing; manual, punched card, and electronic data processing principles and procedures; basic machine language and advanced language programming techniques; phases of data systems development; the role of the manager in management information systems. Emphasis on proper use of data processing as another tool of management. Second Session: MWF 6:10–8 pm.

221 Management Information Systems Development and Application (3)

Development of management information systems, integration of data processing in operations of government or business, impact on management organization and decision making. Case studies. Prerequisite: B&PA 218 or 219, 224; or permission of instructor. First Session: MWF 6:10–8 pm.

222 Seminar: Advanced Digital Computer Concepts (3)

Advanced problems in the design and application of computer systems. Admission by permission of instructor. Second Session: MWF 8:10–10 pm.

Chemistry

C.R. Naeser, *Chairman*

11–12 General Chemistry (4–4)

A year course: credit toward a degree at this University given on completion of Chem 12. Elementary course in general chemistry, including qualitative analysis. Prerequisite: one year of high school algebra. Labora-

tory fee, \$18 each session. First Session: Chem 11; Second Session: Chem 12. MWF 8:10 am–1 pm; TTh 8:10–11:10 am.

22 Introductory Quantitative Analysis (4)

Theory and practice of quantitative analysis by classical volumetric and gravimetric methods and introduction to instrumental analysis. Prerequisite: Chem 12. Laboratory fee, \$18. First Session: MTWThF 8:10 am–12:30 pm.

51–52 Organic Chemistry (3–3)

A year course: credit toward a degree at this University given on completion of Chem 52. Chemistry of the compounds of carbon. Prerequisite: Chem 12 or 16. First Session: Chem 51; Second Session: Chem 52. MTWThF 8:10–9:40 am.

53–54 Organic Chemistry Laboratory (1–1)

Laboratory complement of Chem 51–52. Prerequisite or concurrent registration: Chem 51–52. Prerequisite to Chem 54: Chem 53. Laboratory fee, \$12 each session. First Session: Chem 53; Second Session: Chem 54. MWF 9:50 am–1 pm.

295 Research (arr.)

Research on problems approved by the staff. Open to qualified students with advanced training. May be repeated once for credit. Laboratory fee, \$7.50 a semester hour. Both sessions.

299–300 Thesis Research (3–3)

Laboratory fee, \$18 each session. Both sessions.

398 Advanced Reading and Research (arr.)

Limited to students preparing for the Doctor of Philosophy cumulative examinations. May be repeated for credit. Both sessions.

399 Dissertation Research (arr.)

Limited to Doctor of Philosophy candidates. May be repeated for credit. Both sessions.

Chinese

Administered by the School of Public and International Affairs, B.M. Sapin, Dean

Chung-wen Shih, Adviser

5–6 Beginning Intensive Mandarin Chinese, Levels I–II (6–6)

Intensive beginners' course in fundamentals of grammar and pronunciation with graded reading and practice in writing. Listening comprehension and oral practice in language laboratory. Prerequisite to Chin 6: Chin 5 or 2. Laboratory fee, \$17.50 each session. June 15 to July 17: Chin 5*; July 20 to August 21: Chin 6. Classroom—MTWThF 9–11:45 am, tutorial—MTWThF 12:45–1:35 pm, laboratory—MTWThF 1:45–2:35 pm.

* Students register for Chin 6 on June 15.

Civil Engineering

Administered by the Department of Engineering Mechanics,
Alfred Freudenthal, *Acting Chairman*

EIGHT-WEEK COURSES—JUNE 16 TO AUGUST 7

198 Research (1 to 3)

Applied research and experimentation projects, as arranged. Prerequisite: junior or senior status.

298 Research (arr.)

May be repeated for credit.

299–300 Thesis Research (3–3)

399 Dissertation Research (arr.)

Limited to Doctor of Science candidates. May be repeated for credit.

Classics

F. Latimer, *Chairman*

1–2 First-year Latin (3–3)

A year course: credit toward a degree at this University given on completion of Clas 2. Functional presentation of the essentials of the language, appropriate reading selections, development of English derivatives, introduction to Roman life and literature. First Session: Clas 1; Second Session: Clas 2. MTWThF 11:10 am–12:30 pm.

108 Classical Mythology (3)

Mythology of the Greeks and Romans from the creation of the world: tales of the gods, heroes, and great families that have influenced literature, art, and music. In English translation. Prerequisite: Engl 1, 2; or equivalent. First Session: MTWThF 9:40–11 am.

126 The Legacy of Rome (3)

Study of our classical heritage from Ancient Rome; emphasis on literature, political institutions, law, and religion, and their values for the modern world. Admission by permission of instructor. In English translation. Second Session: MTWThF 9:40–11 am.

141 Medieval Latin (3)

Selections from the Vulgate and representative Latin writers through the 11th century. Prerequisite: Clas 101–2 or permission of instructor. May be taken for graduate credit with approval of instructor. First Session: MTWThF 11:10 am–12:30 pm.

Economics

Henry Solomon, *Chairman*

Departmental prerequisite: Econ 1-2 is prerequisite to all other courses in Economics.

1-2 Principles of Economics (3-3)

Survey of the major economic principles, institutions, and problems in contemporary life. Econ 1 is prerequisite to Econ 2. First Session: Econ 1 Section A—MTWThF 9:40-11 am, Section B—MTWTh 5:45-7:25 pm. Second Session: Econ 1 Section C—MTWThF 1:10-2:30 pm; Econ 2 Section A—MTWThF 9:40-11 am, Section B—MTWTh 5:45-7:25 pm.

101 Intermediate Microeconomic Theory (3)

Analysis of supply, demand, and pricing. Second Session: MTWThF 8:10-9:30 am.

102 Intermediate Macroeconomic Theory (3)

Theories of national income determination and growth. First Session: MTWThF 11:10 am-12:30 pm.

121 Money and Banking (3)

Nature of money, credit, commercial banking, and the other financial institutions in the U.S. monetary system. Second Session: MTWTh 5:45-7:25 pm.

181-82 International Economics (3-3)

Econ 181: fundamentals of the monetary theory and pure theory of international trade. Econ 182: analysis of major contemporary problems including balance of payments, international liquidity, and economic development. First Session: Econ 181; Second Session: Econ 182. MTWThF 11:10 am-12:30 pm.

195 Governmental and Industrial Economics (3)

Limited to students in the Navy Graduate Financial Management Program. June 8 to July 31.

217-18 Survey of Economics (3-3)

For graduate students in fields other than Economics; not open to graduate students in Economics. Econ 217: price theory. Econ 218: income and employment theory. First Session: Econ 217—TThF 9:10-11 am; Econ 218—MWTh 6:10-8 pm.

299-300 Thesis Research (3-3)

Both sessions.

391 Seminar: International Economic Policy (3)

Topics selected from current significant policy problems. First Session: MWTh 6:10-8 pm.

398 Advanced Reading and Research (arr.)

Limited to students preparing for the Doctor of Philosophy general examination. May be repeated for credit. Both sessions.

399 Dissertation Research (arr.)

Limited to Doctor of Philosophy candidates. May be repeated for credit.
Both sessions.

Education

B.S. Root, Chairman

Departmental prerequisite: a degree from an accredited institution is prerequisite to all third-group courses in Education.

See also courses in Physical Education, page 80, and in Special Education, pages 91-93.

FIRST 3-WEEK WORKSHOP SESSION—JUNE 16 TO JULY 2

Classes meet Monday through Friday. Each workshop course requires the full day; concurrent registration for another daytime course is not permitted. June 16 to 19—small group discussions, evening; June 22 to July 2—small group discussion and field work, afternoon. Adequate professional preparation is a prerequisite for admission to courses marked with an asterisk (*).

108 Human Development, Learning, and Teaching (3)

Principles of effective teaching based on an understanding of human development and the nature of learning. Prerequisite: Psyc 22. A 6-week course, June 16 to July 24: lecture MW 6:40-9 pm; conference 6-6:40 pm.

112A Educational Measurement (3)

Scope, needs, services to students, selection and construction of teacher-made tests, interpretation of tests for evidence purposes. Prerequisite: Educ 108 and 123. June 16 to 19: lecture 3:45-5:45 pm. June 22 to July 2: lecture 10:10-12 am; conference 9:10-10 am.

†116 Elementary School Social Studies (3)

Content, methods, materials, and activities essential in the elementary school curriculum. Prerequisite: Educ 108 and 123, or teaching experience. June 16 to June 19: lecture 3:45-5:45 pm. June 22 to July 2: lecture 8:10-10 am; conference 10:10-11 am.

***207 Curriculum Materials (3)**

For experienced teachers. Construction of courses of study and classroom teaching aids, with direct application to students' situations. June 16 to 19: lecture 3:45-5:45 pm. June 22 to July 2: lecture 8:10-10 am; conference 10:10-11 am.

***216 Education of Slow-learning Children (3)**

Identification, nature, and needs of slow-learning elementary and junior high school children. Emphasis on diagnosis and treatment of learning

[†]This course may not be taken by students who have completed or plan to enroll in Educ 111.

difficulties. June 16 to 19: lecture 3:45-5:45 pm. June 22 to July 2: lecture 8:10-10 am; conference 10:10-11 am.

***219 Elementary School Classroom Procedures (3)**

Current classroom practices; emphasis on planning, unit teaching, techniques in discipline; individual and group evaluation techniques, resources for learning, providing for individual differences. June 16 to 19: lecture 3:45-5:45 pm. June 22 to July 2: lecture 8:10-10 am; conference 10:10-11 am.

245 School and Community (3)

The school as an important member of a team of social agencies that builds the community. June 16 to 19: lecture 3:45-5:45 pm. June 22 to July 2: lecture 10:10-12 am; conference 9:10-10 am.

***251 Foundations of Guidance and Personnel Services (3)**

Introductory survey; definitions, scope, principles, historical background, organization, services, emerging trends, and issues. June 16 to 19: lecture 3:45-5:45 pm. June 22 to July 2: lecture 8:10-10 am; conference 10:10-11 am.

***255 Secondary Education (3)**

Current proposals for improvement of secondary education. June 16 to 19: lecture 3:45-5:45 pm. June 22 to July 2: lecture 8:10-10 am; conference 10:10-11 am.

***257 Educational and Occupational Development (3)**

Theories of career development; structure of education, training, and work in the United States; sources, forms, collection, evaluation, and dissemination of educational-occupational information. June 16 to 19: lecture 3:45-5:45 pm. June 22 to July 2: lecture 10:10-12 am; conference 9:10-10 am.

260 Secondary School Supervision (3)

For experienced teachers and administrators with two or more years of teaching experience. Review of modern supervisory concepts including practices followed in the operation of the school. June 16 to 19: lecture 3:45-5:45 pm. June 22 to July 2: lecture 10:10-12 am; conference 9:10-10 am.

261 Practicum in Guidance (3 to 6)

Supervised practical instruction. Prerequisite: graduate work in counseling. Admission by permission of Department Chairman. A 6-week course, June 16 to July 24: MTWThF 1:10-3 pm.

316 Curriculum Developments in Elementary School Social Studies (3)

For experienced educational personnel. Research, techniques, materials, and innovative programs relating to the effective elementary school social studies curriculum. Admission by permission of instructor. June 16 to 19: lecture 3:45-5:45 pm. June 22 to July 2: lecture 8:10-10 am; conference 10:10-11 am.

336 Practicum in Reading (3)

Supervised experience in testing and teaching in the Reading Center. Admission by permission of instructor. A 6-week course, June 16 to July 24.

380 Sensitivity Training: Laboratory Method (3)

A sensitivity learning experience in human relations using unstructured group experience, individual feedback, experimentation, and practice. Admission by permission of instructor. June 16 to 26: lecture and laboratory 9:10–12 am and 1:10–5 pm. June 30 to July 2: individual projects as assigned and conference.

Psyc 22A Introduction to Educational Psychology (3)

Consideration of individual and group differences, adjustments, and the psychology of learning in relation to education and training. June 16 to 19: lecture 3:45–5:45 pm. June 22 to July 2: lecture 10:10–12 am; conference 9:10–10 am.

SECOND 3-WEEK WORKSHOP SESSION—JULY 6 TO JULY 24

Classes meet Monday through Friday. Concurrent registration for another day-time course is not permitted, because each workshop course requires the full day—lecture and conference in the morning; small group discussion and field work in the afternoon. Adequate professional preparation is a prerequisite for admission to courses marked with an asterisk (*).

†115 Elementary School Teaching of Reading (3)

Introduction to methods, techniques, materials, and activities essential to a good elementary school reading program. Prerequisite: Educ 108 and 123, or teaching experience. Lecture 10:10–12 am; conference 9:10–10 am.

†120 Elementary School Mathematics (3)

Content, methods, materials, concepts of “new mathematics,” and activities essential in the elementary school curriculum. Prerequisite: Educ 108 and 123, or teaching experience. Lecture 8:10–10 am; conference 10:10–11 am.

***160 Institute in Comparative Education (3)**

Survey and comparison of educational plans and procedures used in selected foreign countries utilizing embassy resources. Planned to provide the classroom teacher with a deeper understanding of foreign cultures and educational systems. Lecture 9:10–11 am; conference 11:10–12 am.

***223 Reading Problems (3)**

Elementary and secondary school reading difficulties; classroom and clinical techniques in solving reading problems. Prerequisite: one or more years of recent teaching experience. Lecture 10:10–12 am; conference 9:10–10 am.

***243 Human Relations in Education (3)**

(Formerly Human Relations in the Classroom)

Principles and practices in human relations between and among learner, teacher, other school personnel, and parents. Lecture 10:10–12 am; conference 9:10–10 am.

† This course may not be taken by students who have completed or plan to enroll in Educ 111.

253 Analysis of the Individual for Purposes of Counseling (3)

Detailed study of individual analysis and appraisal techniques. Development of systematic case study. Prerequisite: Educ 112 or equivalent. Lecture 8:10-10 am; conference 10:10-11 am.

***256 Secondary Education (3)**

Current problems in each subject-matter field. Lecture 8:10-10 am; conference 10:10-11 am.

***285 Student Activities (3)**

Nature and purposes of selected activities—homeroom, clubs, assemblies, school publications, student council, interscholastic contest; particular attention to sponsorship, participation, finance, and evaluation. Lecture 10:10-12 am; conference 9:10-10 am.

320 Curriculum Developments in Elementary School Mathematics (3)

For experienced educational personnel. Research, techniques, materials, and innovative programs relating to the effective elementary school mathematics curriculum. Admission by permission of instructor. Lecture 8:10-10 am; conference 10:10-11 am.

352 Advanced Career Development (3)

Advanced workshop for experienced counselors; theory and uses of new educational media in guidance; field study of job opportunities in area business, industry, and government agencies. Admission by permission of instructor. Lecture 1:10-3 pm; field work 9:10-12 am.

***354 Counseling of Minority Groups (3)**

Consideration of problems and approaches related to counseling cultural and racial minorities in the American society; emphasis placed on counseling the disadvantaged in urban areas. Lecture 10:10-12 am; conference 9:10-10 am.

357 Mental Hygiene (3)

Mental health problems; emphasis on needs of counselors, teachers, and others working with children and adolescents. Lecture 8:10-10 am; conference 10:10-11 am.

***375 Introduction to Student Personnel Work (3)**

Student personnel services in American higher education. Personnel work as an integral part of the college program; introduction to the literature of the field. Lecture 10:10-12 am; conference 9:10-10 am.

SIX-WEEK SESSION—JULY 6 TO AUGUST 14

Adequate professional preparation is a prerequisite for admission to courses marked with an asterisk (*).

107 Elementary School Teaching Foundations (9)

Limited to students in the M.A.T. Program in Elementary Education. A block course, dealing with the content of traditional courses in educational psychology; history of education; human development, learning, and teaching; society and the school; introduction to elementary education. 135 class hours, supplemented by field experience (August 30-September 16). MTWThF 9-12 am; field work—afternoon.

112B Educational Measurement (3)

This special section of Educ 112 is limited to students in the M.A.T. Program in Elementary Education. Scope, needs, services to students, selection and construction of teacher-made tests, interpretation of tests for evidence purposes. Prerequisite: Educ 108 and 123. MW 1-3 pm.

†113 Elementary School Art (3)

For undergraduates in the elementary school curriculum. Materials and methods. Prerequisite: Psyc 1 and 22. Material fee, \$5. TTh 6-9 pm.

†123 Society and the School (3)

Historical and social development of education at local, national and international levels; cooperation of the school with other community agencies; functions of school personnel. TTh 6:40-9 pm; conference 6-6:40 pm.

†153 Early Childhood Classroom Management (3)

Lecture and field. Types of schools, planning, physical facilities, records, the team approach, working with parents. Admission by permission of instructor. TTh 6:40-9 pm; conference 6-6:40 pm.

***218 Philosophy of Education (3)**

Social foundations of education—forces that shape policies and offerings of the school. MW 1-3:20 pm; two conference hours as arranged.

***229 Administration of Elementary Education (3)**

For experienced teachers and administrators. Achieving instructional objectives, organizing and servicing teaching activities, coordinating school and community life. TTh 1-3:20 pm; conference MWF 1-2 pm.

***†233 Audio-Visual Education (3)**

Selection, evaluation, and use of audio-visual materials; administrative problems in care, operation, maintenance, and use of such materials and equipment. Material fee, \$7. MW 6:40-9 pm; two conference hours as arranged.

***271 The Teacher and School Administration (3)**

Role of federal, state, and local administrative units; school finance; legal controls; school plant; public support; improving teaching conditions. TTh 4:10-6 pm; two conference hours as arranged.

***†274 Teacher Education (3)**

Recruitment and selection, general education, teaching-field preparation, professional sequences, laboratory experiences. MW 6:40-9 pm; two conference hours as arranged.

***†278 School Law (3)**

Sources and scope of school law; legal rights and responsibilities of teachers, pupils, and taxpayers. Other legal problems of major interest to the group. MW 6:40-9 pm; two conference hours as arranged.

***†283 Higher Education in the United States (3)**

Development, scope, purposes, present status, programs, and trends in higher education in the United States. MW 6:40-9 pm; conference 6-6:40 pm.

† Enrollees fully employed may not register for another course.

293-94 Research and Independent Study (3-3)

Individual research under guidance of a staff member. Program and conferences arranged with an instructor.

***295 Research Methods and Procedures (3)**

Required of all candidates for graduate degrees in Education. To be taken early in the graduate program. Prerequisite: elementary course in statistics. Section A: TTh 1:10-3:30 pm; two conference hours as arranged. Section B: MW 3:40-6 pm; two conference hours as arranged. Section C†: MW 6:40-9 pm; two conference hours as arranged.

***296 Seminar: Educational Research (3)**

Analysis of scientific approaches to problems in education and evaluation of the application of research techniques. Required of all candidates for the Ed.D. degree and open to candidates for other advanced degrees. Prerequisite: Educ 295 or equivalent. MW 4:10-6 pm; two conference hours as arranged.

***†298 Seminar: Personnel Administration (3)**

Research: policies, rules and regulations, staff organizations, negotiations. TTh 6:40-9 pm; two conference hours as arranged.

299-300 Thesis Research (3-3)

Required of Master of Arts in Education candidates writing Master's theses.

***†301 Data Processing in Education (3)**

Machine accounting and computer technology for counselors, teachers, and administrators. TTh 6:40-9 pm; two conference hours as arranged.

***†333 Early Childhood Classroom Management (3)**

Lecture and field. Planning, reporting, records, equipment, space use, working with parents, and survey of types of preschools. TTh 6:40-9 pm; conference 6-6:40 pm.

THIRD 3-WEEK WORKSHOP SESSION—JULY 27 TO AUGUST 14

Classes meet Monday through Friday. Concurrent registration for another daytime course is not permitted, because each workshop course requires the full day—lecture and conference in the morning; small group discussion and field work or laboratory in the afternoon. Adequate professional preparation is a prerequisite for admission to courses marked with an asterisk (*).

114 Elementary School Music (3)

For undergraduates in the elementary school curriculum. Materials and methods. Prerequisite: Psyc 1 and 22. Lecture 10:10-12 am; conference 9:10-10 am.

† Enrollees fully employed may not register for another course.

†117 **Elementary School Science (3)**

Content, methods, materials, and activities essential in the elementary school curriculum. Prerequisite: Educ 108 and 123, or teaching experience. Lecture 8:10–10 am; conference 10:10–11 am.

†128 **Children's Literature (3)**

Newer books for children and the children's classics, contribution of literature to child development, children's original expressions. Lecture 8:10–10 am; conference 10:10–11 am.

*208 **Human Development (3)**

Contribution of various disciplines to an understanding of human development throughout the life span; emphasis on practical implications of relevant research. Lecture 8:10–10 am; conference 10:10–11 am.

214 **History of Education (3)**

Evolution of the American school system. Lecture 1:10–3 pm; conference 3:10–4 pm.

*231 **Secondary School Classroom Procedures (3)**

Current classroom practices: teacher-pupil planning, group procedures, initiatory and culminating activities, individual and group evaluation techniques, teaching aids, etc.; review of recent literature. Lecture 8:10–10 am; conference 10:10–11 am.

*241 **Education of the Gifted (3)**

For classroom teachers. Nature and discovery of giftedness, provisions for the gifted in regular classes, experimental projects. Lecture 10:10–12 am; conference 9:10–10 am.

258 **Techniques of Counseling (3)**

Intensive study of educational and psychological processes involved in counseling interviews. Vocational, educational, and personal counseling problems. Prerequisite: 12 semester hours in testing and guidance, including Educ 253 and 257. Lecture 10:10–12 am; conference 9:10–10 am.

*272 **The Teacher and School Supervision (3)**

Nature, organization, human relationships, and techniques. Lecture 10:10–12 am; conference 9:10–10 am.

317 **Curriculum Developments in Elementary School Science (3)**

For experienced educational personnel. Research, techniques, materials, and innovative programs relating to the effective elementary school science curriculum. Admission by permission of instructor. Lecture 8:10–10 am; conference 10:10–11 am.

*376 **Student Personnel Work with College Groups (3)**

Principles and procedures of personnel work with campus groups. Promotion, limitation, and coordination of campus group activities; development of student leadership. Lecture 10:10–12 am; conference 9:10–10 am.

† This course may not be taken by students who have completed or plan to enroll in Educ 111.

Electrical Engineering

A.C. Meltzer, *Acting Chairman*

153 Design of Switching Systems (3)

Switching algebra and Boolean logic; analysis and design of switching devices; design of combinational and sequential logic networks; minimization techniques and their use in logic design; electronic implementation of logic; number systems and codes, geometric interpretation, error-correcting codes; encoding and decoding; logic and electronic design of functional digital units. Prerequisite: EE 152 or permission of instructor. May be taken for graduate credit. An 8-week course, June 16 to August 7: MW 4:10-6:40 pm.

154 Digital Computer Design (3)

Logic and electronic design of functional digital units, design of computer subsystems, flow of information and logical flow diagrams in timing and control; design of memory, arithmetic, and I/O units; binary and decimal machine arithmetic; design of a digital computer. Prerequisite or concurrent registration: EE 153 or permission of instructor. May be taken for graduate credit. An 8-week course, June 16 to August 7: TTh 4:10-6:40 pm.

184 Introduction to Medical Engineering (3)

Designed to introduce the engineering or physical sciences student to the applications of engineering in the medical sciences; terminology of the medical profession emphasized; the physiology of the human body presented from overall systems or functional approach; survey of present-day medical measurements and consideration of those areas in which engineering may be applied advantageously to medicine. May be taken for graduate credit. Admission by permission of instructor. An 8-week course, June 16 to August 7: MW 4:10-6:40 pm.

198 Research (1 to 3)

Applied research and experimentation projects, as arranged. Prerequisite: junior or senior status. An 8-week course, June 16 to August 7.

243 Communication Theory I (3)

Probability, random processes, correlation functions, and power spectra. Output distributions of linear and nonlinear devices with random inputs. Optimum receiver principle, vector channels, optimum receivers for binary and M-ary signals over white Gaussian channels and their error probabilities for different signal sets such as simplex and orthogonal signals. Prerequisite: EE 143. Prerequisite or concurrent registration, Ap S 211. First Session: MTWTh 5:45-7:25 pm.

244 Communication Theory II (3)

Schemes of efficient signaling for data sequences and their performance analysis. Channel models, filtering, and optimum modulation and demodulation. Signaling over fading channels and their optimum receivers. Diversity transmission and various reception schemes. Prerequisite: EE 243. Second Session: MTWTh 5:45-7:25 pm.

271 Automatic Control in State Space Setting (3)

State space formulation of continuous systems, simulation diagrams, transfer function matrices, matrix representation of state equations, controllability

ity and observability, the state transition matrix, stability analysis, methods of Liapunov. Prerequisite: EE 172 or permission of instructor. An 8-week course, June 16 to August 7: TTh 4:10-6:40 pm.

298 Research (arr.)

May be repeated for credit. An 8-week course, June 16 to August 7.

299-300 Thesis Research (3-3)

Both halves offered June 16 to August 7.

399 Dissertation Research (arr.)

Limited to Doctor of Science candidates. May be repeated for credit. An 8-week course, June 16 to August 7.

Engineering Administration

H.E. Smith, *Chairman*

EIGHT-WEEK COURSES—JUNE 16 TO AUGUST 7

115 Probabilistic and Statistical Methods in Engineering (3)

(Formerly *Engineering Analysis*)

Solution of engineering problems using sets and functions; probability models; distributions and functions; statistical concepts and methods, including hypothesis testing, correlation, and regression. Prerequisite: Math 32 or 24. MW 6:10-8:40 pm.

211-12 Engineering Administration (3-3)

Comprehensive and systematic study of the administrative process with emphasis on industrial, scientific, and engineering environments. Planning: objectives, prediction, policies, plans and characteristics of plans. Organizing: theory of organization, structure, authority, specialization, delegation, staff and committees. Directing: leadership, managing human and material resources. Controlling: setting standards, evaluating performance, using system feedback data for correction and improvement.

E Ad 211: TTh 6:10-8:40 pm; E Ad 212: MW 3:10-5:40 pm.

298 Research (arr.)

Basic or applied research in engineering administration. May be repeated for credit.

300 Thesis Research (3)

Engineering Mechanics

Alfred Freudenthal, *Acting Chairman*

EIGHT-WEEK COURSES—JUNE 16 TO AUGUST 7

298 Research (arr.)

Basic research projects as arranged. May be repeated for credit.

299-300 **Thesis Research** (3-3)399 **Dissertation Research** (arr.)

Limited to Doctor of Science candidates. May be repeated for credit.

English

J.P. Reesing, Jr., *Chairman*

Students whose College Board English Composition Achievement Test scores suggest inadequate preparation may be assigned to Engl 1x or may be tested in vocabulary, spelling, grammar, standard usage, and writing skill, before placement in either Engl 1x or 1. Students whose scores indicate marked superiority will be allowed to waive the Engl 1 requirement.

All students enrolled in curricula leading to Bachelor's degrees in Columbian College (who are required to take one year of English composition and one year of literature in English, Classics, French, German, Italian, Slavic, or Spanish) will follow the sequence of Engl 1 or 1x, both semesters of one of the introductory literature courses, and Engl 40.

Engl 2 is the second half of the six-hour composition requirement of students not required to follow the Columbian College of Arts and Sciences sequence.

Departmental prerequisite: Engl 1 or 1x is prerequisite to all other courses in English. One of the following six-hour courses—Engl 51-52, 71-72, or 91-92; Clas 71-72; Fren 51-52; Germ 51-52; Ital 51-52; Slav 91-92; or Span 51-52—is prerequisite to all second-group courses in English except Engl 115 and Engl 161-62.

ENGLISH COMPOSITION

A English for Foreign Students (3)

Reading and writing to assist the foreign student in overcoming deficiencies in the use of English. Special attention to spelling, syntax, grammar, idiom, and vocabulary. First Session: MTWTh 5:45-7:25 pm.

B English for Foreign Students (3)

For second-semester foreign students not ready for Engl 1. Writing of expository paragraphs and themes; outlining; reading for comprehension, vocabulary, and style. First Session: MTWTh 7:35-9:15 pm.

1 English Composition (3)

Analysis and practice of expository techniques with emphasis on unity, development, organization, and coherence; library research procedure. First Session: MTWThF 11:10 am-12:30 pm.

2 English Composition (3)

For second-semester freshmen not following the Columbian College sequence. Readings and practice in expository and argumentative techniques; research practice. Credit not given to students with credit for Engl 40. Prerequisite: Engl 1 or 1x. Second Session: MTWThF 9:40-11 am.

40 English Composition (3)

Second half of the 6-hour English Composition course required of Columbian College students. Critical analysis and practice in expository and argumentative techniques; research practice. Credit not given to students with credit for Engl 2. Prerequisite: Engl 1 or 1x and both semesters of one of the introductory literature courses. Second Session: MTWThF 11:10 am-12:30 pm.

ENGLISH LITERATURE

51-52 Introduction to English Literature (3-3)

Historical survey. Prerequisite: Engl 1 or 1x. First Session: Engl 51; Second Session: Engl 52. MTWThF 9:40-11 am.

112 Chaucer (3)

(Formerly Engl 122)

Second Session: MTWThF 1:10-2:30 pm.

123 Principles of Literary Criticism (3)

(Formerly Engl 195)

Topic for summer: Critical Theory of the Novel. First Session: MTWThF 9:40-11 am.

127-28 Shakespeare (3-3)

(Formerly Engl 135-36)

First Session: Engl 127; Second Session: Engl 128. MTWThF 8:10-9:30 am.

135 Victorian Literature (3)

(Replaces former Engl 162)

Poetry and prose, 1830-1900. First Session: MTWThF 11:10 am-12:30 pm.

152 Introduction to Contemporary Poetry (3)

Study of works by representative contemporary poets, with particular attention to the mythic tradition in poetry. Second session: MTWThF 4:10-5:30 pm.

234 Studies in the Romantic Movement (3)

(Formerly Engl 252)

A study of the London Romantic writers, based on the prose works and correspondence of Lamb, Coleridge, Hazlitt, De Quincey, and Leigh Hunt. Second Session: MWTh 4:10-6 pm.

AMERICAN LITERATURE

71-72 Introduction to American Literature (3-3)

Historical survey. Engl 71: from beginnings to the Civil War. Engl 72: from the Civil War to present. Prerequisite: Engl 1 or 1x. First Session: Engl 71; Second Session: Engl 72. MTWTh 5:45-7:25 pm.

161 Studies in American Literature (3)

(Formerly Engl 171)

Same as AmCv 161. Major factors in the national cultural tradition as shown by outstanding writers. Prerequisite: Engl 51-52 or 71-72. First Session: MTWThF 11:10 am-12:30 pm.

164 Major American Poets (3)

(Formerly Engl 174)

Advanced critical study of significant writers and movements: the 20th century. First Session: MTWThF 9:40–11 am.

166 American Drama (3)

(Formerly Engl 176)

Historical and critical study of significant plays and forms since 1930. Second Session: MTWThF 9:40–11 am.

170 The American Short Story (3)

Historical development of the short story in America. Second Session: MTWThF 1:10–2:30 pm.

171 Major American Writers (3)

Poe, Hawthorne, and Melville: critical study of the major prose writings. First Session: MTWThF 1:10–2:30 pm.

173 Selected Literary Movements (3)

Twentieth Century Southern Writing: fiction, poetry, drama, and criticism. First Session: MTWThF 4:10–5:30 pm.

178 Contemporary American Literature (3)

American fiction, poetry, drama, and essay since World War II. Second Session: MTWThF 11:10 am–12:30 pm.

268 Seminar: American Fiction (3)

(Formerly Engl 278)

Second Session: MWTh 6:10–8 pm.

284 Seminar: American Literature, 1865–1900 (3)

(Formerly Engl 271)

Intensive study of works of Twain, Howells, Henry James, Norris, and Stephen Crane. First Session: as arranged.

French

Administered by the Department of Romance Languages and Literatures, J.F. Burks, *Chairman*

Placement Examination: a standardized placement examination given before registration is required of all entering students who wish to continue in college the language begun in high school. Upon completion of the examination, assignment is made to the appropriate course, with credit assigned on the usual basis.

Departmental prerequisite: Fren 3–4 or 6, or equivalent, is required (Fren 51–52 is recommended) as prerequisite to all second-group courses in French.

1–2 First-year French (3–3)

A year course: credit toward a degree at this University given on completion of Fren 2. For beginners. Pronunciation, conversation, grammar, composition, reading of modern French prose. Aural training, oral practice in language laboratory. Laboratory fee, \$17.50 a session. First

Session: Fren 1; Second Session: Fren 2. Classroom—MTWThF 9:40–11 am, laboratory—MTh 11:10–12 am.

6 Second-year French (Intensive) (6)

Intensive course which covers material of Fren 3–4. Grammar review, reading, conversation. Prerequisite: two years of high school French with grades of *B* or better; Fren 2 or 2x. First Session: classroom—MTWThF 9:40–11 am and 1:10–2:30 pm, tutorial—MTWThF 9–9:30 am.

12 French Conversation and Composition (Intensive) (6)

Intensive course which covers material of Fren 9–10. Two class meetings and one laboratory meeting every day. Laboratory fee, \$25. Second Session: classroom—MTWThF 9:40–11 am and 1:10–2:30 pm, laboratory—MTWThF 9–9:30 am.

49 French for Graduate Students (0)

For graduate students preparing for reading examinations. No academic credit. Tuition fee, \$204. First Session: MTWThF 6–7:20 pm.

109–110 Advanced French Conversation and Composition (3–3)

Fren 109: emphasis on diction. Fren 110: emphasis on style. Prerequisite: Fren 10 or equivalent and permission of instructor. First Session: Fren 109; Second Session: Fren 110. MTWThF 11:10 am–12:30 pm.

130 Contemporary French Literature (3)

First Session: MTWThF 1:10–2:30 pm.

193 Cours de style (3)

Advanced grammar, composition, and stylistics. Open to both advanced undergraduate and graduate students. Recommended for majors and teachers of French. First Session: MTWThF 4:10–5:30 pm.

256 19th Century French Literature (3)

Topic for summer: Symbolism. First Session: MWTh 4:10–6 pm.

295 Independent Reading and Research in French Literature (arr.)

For students preparing for the Master of Arts degree. May be repeated for credit. First Session.

299–300 Thesis Research (3–3)

Both sessions.

For information concerning courses offered in a special program at the American College in Paris, see page 39.

Geography and Regional Science

M.F. Gordon, *Chairman*

52 World Regions (3)

Survey of major countries, synthesis and analysis of major world regions. First Session: MTWThF 9:40–11 am.

125 Transportation Geography (3)

Problems of interaction, diffusion, and information transfer as they appear in a spatial context. Second Session: MTWThF 11:10 am–12:30 pm.

145 Cultural Geography (3)

Analysis of the relationships between culture and environment; emphasis on spatial and ecological considerations. Second Session: MTWThF 1:10–2:30 pm.

146 World Political Geography (3)

Analysis of the interrelations between the political community and the human and physical environment. First Session: MTWThF 1:10–2:30 pm.

172 Historical Geography (3)

Study of man's transformation and use of the earth as viewed within a specific historical frame of reference. First Session: MTWThF 11:10 am–12:30 pm.

189–90 Readings in Geography (arr.)

Both sessions.

295 Research (arr.)

Both sessions.

299–300 Thesis Research (3–3)

Both sessions.

Geology

Geza Teleki, *Chairman*

1–2 Introductory Geology (3–3)

Survey covering the principles of geology. Laboratory fee, \$10 each session. First Session: Geol 1; Second Session: Geol 2. MTWTh 9:40 am–1 pm.

147 Chemical Geology in the Earth and Ocean Sciences (3)

Introduction to geochemical and chemical principles involved in the understanding of geological systems, and their application to contemporary problems in oceanology, pollution, and mineral exploration. Laboratory fee, \$12. First Session: MTWTh 9:40 am–12:45 pm.

299–300 Thesis Research (3–3)

Both sessions.

398 Advanced Reading and Research (arr.)

Limited to students preparing for the Doctor of Philosophy general examination. May be repeated for credit. Both sessions.

399 Dissertation Research (arr.)

Limited to Doctor of Philosophy candidates. May be repeated for credit. Both sessions.

Germanic Languages and Literatures

L.G. Seeger, *Chairman*

Placement Examination: a standardized examination given before registration is required of all entering students who wish to continue in college the language begun in high school. Upon completion of the examination, assignment is made to the appropriate course, with credit assigned on the usual basis.

1-2 First-year German (3-3)

A year course: credit toward a degree at this University given on completion of Germ 2. Essentials of German grammar; translation of easy prose. Aural-oral practice in language laboratory. Laboratory fee, \$17.50 each session. First Session: Germ 1; Second Session: Germ 2. Classroom: MTWThF 6-7:20 pm. Laboratory: Section M—MTh 5-5:50 pm; Section N—MTh 7:30-8:20 pm.

3-4 Second-year German (3-3)

A year course: credit toward a degree at this University given on completion of Germ 4. Selections from modern German prose; continuation and review of grammar. Aural-oral practice in language laboratory. Laboratory fee, \$17.50 each session. Prerequisite: Germ 1-2 or two years of high school German. First Session: Germ 3; Second Session: Germ 4. Classroom: MTWThF 7:35-8:55 pm. Laboratory: Section M—MTh 5-5:50 pm; Section N—MTh 6:30-7:20 pm.

47 Beginning German for Reading Examination Candidates (0)

Specifically for graduate students with little or no German, who are preparing for reading examinations. No academic credit. Tuition fee, \$204. First Session: Section A—MTWTh 5:45-7:25 pm (for majors in the Humanities and Social Sciences); Section B—MTWTh 7:35-9:15 pm (for majors in Mathematics and Natural Sciences).

49 German Readings for Nonmajor Students (3)

Primarily for graduate students preparing for reading examinations. Undergraduates admitted with permission of instructor. No academic credit for graduate students. Prerequisite: Germ 4 or Germ 47, or equivalent. Second Session: Section A—MTWTh 5:45-7:25 pm (for majors in the Humanities and Social Sciences); Section B—MTWTh 7:35-9:15 pm (for majors in Mathematics and Natural Sciences).

Health Care Administration

Leon Gintzig, *Chairman*

270 Research in Health Care Administration (3)

Field research. Primarily for doctoral candidates; open to other graduate students with consent of instructor. Both sessions.

285 Readings in Health Care Administration (3)

Supervised readings in some special areas or subdivisions of health care administration. Primarily for doctoral candidates; open to other students by arrangement. Both sessions.

293 Hospital Residency I (3)

First third of the twelve-month residency, beginning June 1 or July 1 of each year, has four major objectives: work experience under a qualified preceptor; periodic seminars with University staff; periodic written progress reports of work accomplished; and a final written report of a major investigation. Sections A, B, C, and D.

296 Hospital Residency II (3)

First third of the twelve-month residency, beginning June 1 or July 1 of each year. For selected students who take a second year of residency.

History

R.H. Davison, *Chairman*

Departmental prerequisite: Hist 39-40 or 91-92 is prerequisite to courses 108 through 158 and 187 through 196; Hist 71-72, to courses 167 through 185; either Hist 39-40, 71-72, or 91-92, to courses 162 through 166. Prerequisite to Hist 105-6 is either Hist 39-40, 91-92, or a background in a science. Students may waive one or more of the prerequisite courses by passing a departmental waiver examination, by attaining scores of 600 or above on the College Entrance Examination Board Achievement tests, or by good performance on Advanced Placement Examinations.

Prerequisite to all third-group History courses: the appropriate second-group preparation and consent of instructor.

Prerequisite to all fourth-group History courses: the appropriate second-group preparation and consent of instructor. Fourth-group History courses are limited to graduate students; but they are primarily for doctoral candidates.

39-40 European Civilization in Its World Context (3-3)

Primarily for freshmen. Hist 39: political, social, economic, and cultural history from ancient times to early modern era. Hist 40: from early modern era to present. Students cannot receive credit for both Hist 39-40 and 91-92. First Session: Hist 39—MTWThF 8:10-9:30 am; Hist 40A MTWThF 11:10 am-12:30 pm. Second Session: Hist 40B—MTWThF 8:10-9:30 am.

71-72 Introduction to American History (3-3)

Primarily for sophomores. Hist 71: political, social, economic, and cultural forces of the United States in their world setting from 1492 to 1865. Hist 72: from 1865 to present. First Session: Hist 71A—MTWThF 9:40-11 am; Hist 72A—MTWThF 6-7:20 pm. Second Session: Hist 71B—MTWThF 6-7:20 pm; Hist 72B—MTWThF 9:40-11 am.

113 Early Middle Ages (3)

Mediterranean region from 4th to 11th century; emphasis on Byzantium. First Session: MTWThF 11:10 am-12:30 pm.

116 History of Africa (3)

Survey of political, cultural, and economic development from ancient times to the present. First Session: MTWThF 6-7:20 pm.

- 138 History of World Communism (3)**
First Session: MTWThF 4:10-5:30 pm. (See Communist Affairs program, page 35-36.)
- 139 World History in the 20th Century (3)**
From the turn of the century to the Munich settlement of 1938. Second Session: MTWThF 11:10 am-12:30 pm.
- 150 European Diplomatic History since 1890 (3)**
The European state system; diplomatic practices and relations since the Congress of Vienna; emphasis on policies and actions of the great powers and their statesmen. Students cannot receive credit for both Hist 150 and 157. First Session: MTWThF 6-7:20 pm.
- 157 20th Century European Diplomatic History (3)**
The main currents, with necessary 19th century background. Students cannot receive credit for both Hist 157 and 150. Second Session: MTWThF 4:10-5:30 pm.
- 176 U.S. Political History (3)**
Civil War to New Deal. First Session: MTWThF 9:40-11 am.
- 182 U.S. Diplomatic History since 1898 (3)**
Tendencies toward isolation, expansion, and collectivism; disputes with foreign countries and their settlement; activities of American secretaries of state and diplomatic agents. First Session: MTWThF 9:40-11 am.
- 185 Representative Americans (3)**
Significant and pivotal personalities in government, business, science, religion, journalism, the arts, and social reform. Second Session: MTWThF 8:10-9:30 am.
- 187 History of Modern China (3)**
Second Session: MTWThF 4:10-5:30 pm. (See Communist Affairs program, pages 35-36.)
- 193 History of the Near East (3)**
Byzantine, Arab, Persian, and Islamic backgrounds; rise and decline of the Ottoman Empire; action of European powers in the area; Ottoman break-up into the Turkish Republic and other successor states. First Session: MTWThF 1:10-2:30 pm.
- 203-4 Research Seminar (3-3)**
Prerequisite: Departmental approval. First Session: Hist 203; Second Session: Hist 204.
- 275 Research Seminar: U.S. Political History (3)**
Prerequisite: Hist 175-76 or equivalent. First Session: MWF 11:10 am-1 pm.
- 286 Research Seminar: Early American History (1607-1828) (3)**
(Formerly Research Seminar: U.S. Early National Period)
Prerequisite: Hist 170, 175, or 181; or equivalent. First Session: MWF 1:10-3 pm.

291 **Research Seminar: 20th Century Problems—Era of World War I** (3)
Second Session: TTh 1:10–4 pm.

299–300 **Thesis Research** (3–3)
Both sessions.

341 **Readings in Modern European History** (3)
First Session: TTh 3–5:40 pm.

371 **Readings in American Social History** (3)
Second Session: TTh 2:10–5 pm.

387 **Readings in the History of Sino-Soviet Relations** (3)
First Session: MWF 6:10–8 pm. (See Communist Affairs program, pages 35–36.)

396 **Readings in Modern Far Eastern History** (3)
Second Session: MWF 6:10–8 pm. (See Communist Affairs program, pages 35–36.)

399 **Dissertation Research** (arr.)
Limited to Doctor of Philosophy candidates. May be repeated for credit.
Both sessions.

Institute for Sino-Soviet Studies

For information concerning the Communist Affairs program, see pages 35–36.

Journalism

R.C. Willson, *Chairman*

111 **Reporting** (3)
Gathering, evaluating, and writing news. First Session: MTWThF
9:40–11 am.

150 **News Coverage in Washington** (3)
A survey of the way news is gathered and reported in the Nation's Capital by wire services, newspaper bureaus, and the local dailies. Field trips to major news centers; practice coverage. First Session: MTWThF
11:10 am–12:30 pm.

Latin

See "Classics."

Law

A list of courses to be offered during the summer of 1970 at the National Law Center will be available in a Law Center announcement scheduled to be issued during January, 1970. Copies of this announcement may be obtained from the National Law Center.

Mathematics

Hewitt Kenyon, *Chairman*

Departmental prerequisite: Math 33 or 24 is prerequisite to all second-group courses in Mathematics. Exception to this regulation may be made for Math 101, 122, and 124. Students anticipating a substantial concentration in mathematics should consult with the Department about early completion of these courses.

3 College Algebra (3)

Equivalent to second-year high school algebra. Prerequisite: one year each of high school algebra and high school geometry. First Session: MTWThF 6-7:20 pm.

6 Plane Trigonometry (3)

Prerequisite: two years of high school algebra and one year of high school geometry, or Math 3 (or concurrent registration therefor). Second Session: MTWThF 6-7:20 pm.

9 General Mathematics I (3)

For students electing Math 9 and 10 as a terminal sequence. Logic, sets, number systems. Prerequisite: two years of high school mathematics. First Session: Section A—MTWThF 8:10-9:30 am. Second Session: Section B—MTWThF 4:10-5:30 pm.

10 General Mathematics II (3)

Statistics and probability exponents and logarithms, trigonometry. Prerequisite: Math 9. Second Session: MTWThF 8:10-9:30 am.

15 Finite Mathematics I (3)

Introduction to logic, sets, and probability. Prerequisite: two years of high school mathematics. First Session: MTWThF 9:40-11 am.

16 Finite Mathematics II (3)

Vectors and matrices, mathematics of finance and accounting, linear programming, introduction to game theory. Prerequisite: Math 15. Second Session: MTWThF 9:40-11 am.

30 Precalculus (3)

Logic, set theory, real number system, inequalities, basic analytic geometry, functions and relations. Polynomial, trigonometric, logarithmic, and exponential functions. Prerequisite: Math 3 and 6; or one and one-half years of high school algebra, one year of high school geometry, and one-half year of high school trigonometry; or equivalent. First Session:

Section A—MTWThF 7:35–8:55 pm. Second Session: Section B—MTWThF 9:40–11 am.

31 Calculus of One Variable (3)

Differentiation and integration of algebraic and elementary transcendental functions, with simple applications. Prerequisite: Math 30 or equivalent.*

First Session: Section A—MTWThF 11:10 am–12:30 pm. Second Session: Section B—MTWThF 7:35–8:55 pm.

32 Calculus of Several Variables (3)

Partial derivatives, multiple integrals, infinite series. Prerequisite: Math 31.

First Session: Section A—MTWThF 6–7:20 pm. Second Session: Section B—MTWThF 11:10 am–12:30 pm.

33 Calculus of Vector Functions (3)

Elementary linear algebra, vectors, and matrices. Vector calculus, implicit function theory. Prerequisite: Math 32.

Second Session: MTWThF 6–7:20 pm.

34 Introduction to Linear Algebra (3)

Linear functions, solutions of equations, dimension and rank, determinants, eigenvalues, quadratic forms, change of basis. Prerequisite: Math 31 or permission of instructor.

Second Session: MTWThF 7:35–8:55 pm.

107 Introduction to Algebraic Topology (3)

Prerequisite: Math 122 and 139, or permission of instructor.

Second Session: MTWThF 6–7:20 pm.

111 Mathematics for Engineers and Physicists I (3)

Differential equations, linear algebra.

First Session: MTWThF 7:35–8:55 pm.

112 Mathematics for Engineers and Physicists II (3)

Fourier series, Laplace transformation, partial differential equations. Prerequisite: Math 111.

Second Session: MTWThF 7:35–8:55 pm.

113 Graph Theory (3)

Directed and undirected graphs; unicursal graphs; shortest paths; Hamilton circuits; incidence, circuit, and cut-set matrix relations; coloring problems; network flow.

Second Session: MTWThF 7:35–8:55 pm.

122 Introduction to Abstract Algebra (3)

First Session: MTWThF 9:40–11 am.

139 Advanced Calculus I (3)

Review and extension of elementary one-variable calculus, emphasis on the theoretical foundations.

First Session: MTWThF 6–7:20 pm.

140 Advanced Calculus II (3)

Calculus of several variables. Prerequisite: Math 139 or equivalent.

Second Session: MTWThF 6–7:20 pm.

157 Introduction to Complex Variable Theory (3)

Prerequisite: Math 139.

First Session: MTWThF 7:35–8:55 pm.

* Math 30 may be waived as a prerequisite requirement by examination on scheduled dates. Waiving this prerequisite requirement does not entitle the student to any semester hours of credit.

270 Tensor Analysis (3)

First Session: MTWThF 6-7:20 pm.

295 Reading and Research (3)

May be repeated once for credit. Both sessions.

299-300 Thesis Research (3-3)

Both sessions.

398 Advanced Reading and Research (arr.)

Limited to students preparing for the Doctor of Philosophy general examination. May be repeated for credit. Both sessions.

399 Dissertation Research (arr.)

Limited to Doctor of Philosophy candidates. May be repeated for credit. Both sessions.

Mechanical EngineeringAdministered by the Department of Engineering Mechanics,
Alfred Freudenthal, *Acting Chairman***EIGHT-WEEK COURSES—JUNE 16 TO AUGUST 7****131 Thermodynamics (3)**

Fundamental thermodynamic concepts from classical and statistical viewpoints; thermal equilibrium and temperature; the first law of thermodynamics, energy analysis of thermodynamic systems. Approach to equilibrium, entropy and second law of thermodynamics, analysis of thermodynamic systems. Prerequisite or concurrent registration: Ap S 59. TTh 6:10-8:40 pm.

198 Research (1 to 3)

Applied research and experimentation projects, as arranged. Prerequisite: junior or senior status.

298 Research (arr.)

Research as arranged. May be repeated for credit.

299-300 Thesis Research (3-3)**399 Dissertation Research (arr.)**

Limited to Doctor of Science candidates. May be repeated for credit.

Music

George Steiner, *Chairman*

MUSIC HISTORY AND LITERATURE

3 Introduction to Musical Understanding (3)

Introductory history of musical styles, related to listening; elements and materials of music. First Session: Section A—MTWTh 5:45–7:25 pm. Second Session: Section B—MTWThF 11:10 am–12:30 pm.

4 Survey of Music Literature (3)

Introductory study of musical forms, structures, and textures; aural analysis of selected literature. First Session: MTWThF 11:10 am–12:30 pm.

106 Music of the Classic Period (3)

Study of styles, techniques, and literature from the 18th century schools through Haydn, Mozart, and Beethoven. First Session: MTWThF 9:40–11 am.

MUSIC THEORY

1 Elements of Music Theory (3)

Notation, scales, keys, intervals, terms, rhythms, ear-training, sight-singing, elementary keyboard harmony, melodic and harmonic dictation. First Session: Section A—MTWThF 4:10–5:30 pm. Second Session: Section B—MTWThF 1:10–2:30 pm.

299–300 Thesis Research (3–3)

Both sessions.

APPLIED MUSIC

Applied Music courses listed below may be repeated for credit. Each course has individual lessons of 45 minutes twice a week; supplementary fee, \$40.

11 Piano (1)

Both sessions.

13 Voice (1)

Both sessions.

15 Organ (1)

Both sessions.

17 Orchestral Instrument (1)

Both sessions.

19 Classical Guitar (1)

Both sessions.

111 Piano (1)

Both sessions.

113 Voice (1)

Both sessions.

115 Organ (1)

Both sessions.

117 Orchestral Instrument (1)

Both sessions.

119 Classical Guitar (1)

Both sessions.

Philosophy

Thelma Z. Lavine, *Chairman***61-62 Introduction to Philosophy (3-3)***(Phil 61 replaces former 52; Phil 62 replaces former 51)*

Problems of modern philosophy in relation to scientific and social developments since the Renaissance. Phil 61: theories of reality. Phil 62: theories of knowledge. Phil 61 or 62 may be taken independently.

First Session: Phil 61; Second Session: Phil 62. MTWThF 11:10 am-12:30 pm.

111 History of Ancient Philosophy (3)

History of Western philosophy from early Greece to the early Middle Ages. Second Session: MTWThF 1:10-2:30 pm.

162 Aesthetics (3)

Nature of aesthetic experience, problems of appreciation and criticism in the arts, and theories of artistic creation. Emphasis on contemporary arts and criticism. First Session: MTWThF 8:10-9:30 am.

172 American Philosophy (3)

Philosophies of Peirce, Royce, James, Dewey, Santayana, and Whitehead as representatives of American thought. First Session: MTWThF 9:40-11 am.

192 Contemporary Philosophy: Analytical (3)

The two dominant movements of recent Anglo-American philosophy, logical positivism and British ordinary language philosophy, as represented by G.E. Moore, Wittgenstein, Ryle, Austin, Ayer, etc. Second Session: MTWThF 9:40-11 am.

193 Contemporary Philosophy: Phenomenological (3)

The phenomenological movement, including its development into German and French existentialism, and its more recent phases. First Session: MTWThF 11:10 am-12:30 pm.

Physical Education

J.L. Breen, *Chairman*

The University is not responsible for injuries received in intramural games, or in any of the activities of the Department of Physical Education; and the student assumes full responsibility therefor.

4 Physical Education Activities (1)

Five periods of supervised activity a week; coeducational. Medical classification A only. May be repeated for credit not to exceed 4 semester hours. Physical Education fee, \$4.50 a session. First Session: Section A (folk dance)—MTWThF 8-9 am; Section B (badminton)—MTWThF 10-11 am.

57 Dance Technique I (1)

A 3-week course, June 15 to July 2: MTWThF 9-10:30 am. (See Dance Workshop, page 37.)

58 Dance Technique II (1)

A 3-week course, June 15 to July 2: MTWThF 9-10:30 am. (See Dance Workshop, page 37.)

*110 Dance Composition II (1)

A 3-week course, June 15 to July 2: MTWThF 11 am-12:30 pm. (See Dance Workshop, page 37.)

119 Creative Dance for Children (3)

Exploration and understanding of creative movement for children. Evaluation of methods and materials. Dance for children with special education problems. A 3-week course, July 6 to July 24: MTWThF as arranged.

*120 Repertory (1)

A 3-week course, June 15 to July 2: MTWThF 2-3:30 pm. (See Dance Workshop, page 37.)

202 Motor Learning (3)

Theories of motor development and learning; variables of motor performance and learning with implications for teaching movement skills. A 6-week course, June 15 to July 24: TTh 6:10-8 pm.

265 Driver and Safety Education III (3)

Modern methods and materials in traffic safety and driver education; psychological testing; Drivucator; multiple car method. A 6-week course, June 15 to July 24: MW 6:10-8 pm.

*297 Advanced Topical Studies (3)

Independent study or field project pertinent to the needs of the student, including synthesis and critique of background literature. Prerequisite: Educ 295. A 3-week course, June 15 to July 2.

* May be repeated once for credit.

Physics

Julian Eisenstein, *Chairman*

1 General Physics (4)

Topics in classical physics which form a foundation for modern physics. Prerequisite: two years of college preparatory mathematics or concurrent registration for Math 6. Laboratory fee, \$11. First Session: Section A—lecture MTTh 1:10–3 pm, recitation WF 8:10–9:30 am, laboratory MWF 9:40–12 am; Section B—lecture MTTh 1:10–3 pm, recitation WF 1:10–2:30 pm, laboratory MWF 3:10–5:30 pm.

2 Introduction to Modern Physics (4)

(Formerly General Physics)

Selected topics in modern physics, including electromagnetic phenomena. Prerequisite: Phys 1 or equivalent. Phys 1 may be waived on the basis of the College Entrance Examination Board Achievement Test or by a departmental examination prior to registration. Waiving this prerequisite requirement does not entitle the student to any semester hours of credit. Laboratory fee, \$11. Second Session: Section A—lecture MTTh 1:10–3 pm, recitation WF 8:10–9:30 am, laboratory MWF 9:40–12 am; Section B—lecture MTTh 1:10–3 pm, recitation WF 1:10–2:30 pm, laboratory MWF 3:10–5:30 pm.

299–300 Thesis Research (3–3)

Both sessions.

Political Science

W.H. Kraus, *Chairman*

Departmental prerequisite: P Sc 5–6 is prerequisite to all second-group courses in Political Science.

5–6 Introduction to Political Science (3–3)

P Sc 5: structure, powers, and processes of the American political system—Congress, the President, and the Supreme Court; elections, political parties, and pressure groups; state and local government. P Sc 6: nature and study of politics—theories, forms, and processes of political systems; international relations and political ideologies. First Session: P Sc 5A and 6A—MTWThF 11:10 am–12:30 pm. Second Session: P Sc 5B—MTWThF 9:40–11 am; P Sc 6B—MTWThF 11:10 am–12:30 pm.

101 Far East in the Modern World (3)

First Session: MTWThF 8:10–9:30 am. (See Communist Affairs program, pages 35–36.)

103–4 State and Local Governments (3–3)

(Replaces former P Sc 103 Metropolitan Government and Politics and P Sc 104 State and Local Governments)

P Sc 103: state and local political systems, theory of sub-national governments, intergovernmental relations, metropolitan government and politics.

P Sc 104: urban political systems, issues in urban politics, city and re-

gional planning and the political process. First Session: P Sc 103; Second Session: P Sc 104. MTWThF 8:10-9:30 am.

107 Problems in Modern Political Thought (3)

Development of democratic political institutions and analysis of main ideological changes during the 19th and 20th centuries; attention to the rise of socialism, communism, and fascism. First Session: MTWThF 9:40-11 am.

111 Comparative Government and Politics (3)

Introduction to the government and politics of the principal constitutional democracies of Western Europe: Great Britain, France, and the Federal Republic of Germany; secondary reference to other Western European systems and the communist government of East Germany. First Session: MTWTh 7:35-9:15 pm.

***112 Comparative Government and Politics (3)**

Introduction to the government and politics of the Communist nations; emphasis on the Soviet Union and the countries of Eastern Europe. First Session: MTWThF 11:10 am-12:30 pm.

117-18 Political Theory: Nature and Growth of Western Political Thought (3)

P Sc 117: foundations of Western political thought with emphasis on classical antiquity; Western political tradition. P Sc 118: the Renaissance and Reformation to recent times. Theoretical foundations of the modern state: morals and politics, sovereignty, absolutism, obedience, and resistance; liberalism, democracy, conservatism. First Session: P Sc 117; Second Session: P Sc 118. MTWTh 5:45-7:25 pm.

121 U.S. Constitutional Law and Politics (3)

Separation of powers, federal-state relationships, economic regulation. Second Session: MTWThF 11:10 am-12:30 pm.

126 The American Presidency (3)

Role of the Presidency in public policy formulation, development of the institution, the selection process, emphasis on legislative-executive relations. First Session: MTWThF 9:40-11 am.

145 Political Parties and Politics (3)

Organization and operation of political parties in the United States: party system and structure, role of ideology, voting behavior, campaigns and elections, devices for organizing the government. First Session: MTWThF 9:40-11 am.

160 Modern Communist Ideologies (3)

First Session: MTWThF 4:10-5:30 pm. (See Communist Affairs program, pages 35-36.)

***161 Soviet Government and Politics (3)**

First Session: MTWTh 7:35-9:15 pm. (See Communist Affairs program, pages 35-36.)

* P Sc 112, 115, and 161 are related in their subject matter, and credit for only one of the three may be applied toward a degree.

163 Soviet Foreign Policy (3)

First Session: MTWTh 5:45-7:25 pm. (See Communist Affairs program, page 35-36.)

171 International Politics (3)

International actors, international and domestic environments of foreign policy, global and regional patterns, general characteristics of foreign policy. Second Session: MTWThF 1:10-2:30 pm.

177 Governments and Politics in Latin America (3)

Political processes and institutions in Latin America; emphasis on Argentina, Brazil, Chile, and Mexico. Second Session: MTWThF 11:10 am-12:30 pm.

181 Public International Law and Organization (3)

Survey of the public law of nations; emphasis on the law of peace. Second Session: MTWThF 1:10-2:30 pm.

189 African International Politics (3)

Analysis of interstate relations in Africa and of selected aspects of African relations with the outside world. First Session: MTWThF 11:10 am-12:30 pm.

190 Politics of Middle and Southern Africa (3)

Comparative analysis of the political systems of selected countries of non-Mediterranean Africa. First Session: MTWThF 1:30-2:50 pm.

194 Governments of China and Japan (3)

First Session: MTWThF 9:40-11 am. (See Communist Affairs program, pages 35-36.)

297 Independent Studies (arr.)

Limited to Master's candidates. Permission of instructor, in writing, required. First Session.

299-300 Thesis Research (3-3)

Both sessions.

Psychology

I. Levy, *Chairman*

Departmental prerequisite: Psyc 1 or 5-6 is prerequisite to all other courses in Psychology. Six semester hours in first-group Psychology courses are prerequisite to all second-group courses in Psychology. Third-group Psychology courses are open only to graduate students, except by special permission of instructor and Chairman of the Department.

1 General Psychology (3)

Fundamental principles underlying human behavior. First Session: Section A—MTWThF 8:10-9:30 am; Section B—MTWThF 4:10-5:30 pm. Second Session: Section C—MTWThF 9:40-11 am; Section D—MTWTh 5:45-7:25 pm.

8 Psychology of Motivation and Personality (3)

Introduction to the psychology of personality. Principles of motivation, personality development, social and cultural factors, and assessment and description of personality emphasized. First Session: MTWThF 9:40-11 am.

22 Introduction to Educational Psychology (3)

Consideration of individual and group differences, adjustments, and the psychology of learning in relation to education and training. First 3-Week Education Workshop Session, June 16 to July 2: Section A—June 16-19, lecture 3:45-5:45 pm, small group discussions—evening; June 22-July 2, lecture 10:10-12 am, conference 9:10-10 am. Second Session: Section B—MTWThF 1:10-2:30 pm.

29 Psychology of Childhood (3)

Developmental approach to study of the child. Emphasis on the socialization process, learning, and the child's view of the world. First Session: MTWThF 1:10-2:30 pm.

101 Abnormal Psychology (3)

Causes, diagnosis, treatment, and prevention of various types of maladjustments and mental disorders. Prerequisite: 6 semester hours in psychology, or 3 in psychology and 6 in a biological science. First Session: Section A—MTWThF 1:10-2:30 pm. Second Session: Section B—MTWTh 5:45-7:25 pm.

110 Cognitive and Perceptual Development (3)

Concepts and research in the area of developmental psychology; emphasis on the growth and development of perception, cognition, and language. First Session: MTWThF 4:10-5:30 pm.

115 Psychology of Language and Communication (3)

Introduction to psycholinguistics and verbal behavior. Information theory, measurement of meaning, cultural and linguistic structures in the perception and learning of language. First Session: MTWThF 4:10-5:30 pm.

121 Psychology of Learning (3)

Current learning theories and issues. First Session: MTWThF 9:40-11 am.

129 Theories of Personality (3)

(Formerly Motivational Factors in Personality)

Survey of personality theories; emphasis on their application to problems of individuals. Second Session: MTWTh 7:35-9:15 pm.

131 Psychological Tests (3)

Survey of psychological tests and their more common uses in business, industry, government, law, medicine, and education. Material fee, \$7. First Session: MTWThF 4:10-5:30 pm.

145 Psychology of Management (3)

Primarily for students in the schools of Engineering and Applied Science and Government and Business Administration. Introduction to principles of industrial organizations and personnel selection. First Session: MWTh 6:10-8 pm.

151 Social Psychology (3)

Social foundations of attitudes and behavior: cognition, motivation, role-behavior, communication, small-group processes, racial attitudes, nationalism, and war. First Session: Section A—MTWTh 5:45–7:25 pm. Second Session: Section B—MTWThF 9:40–11 am.

156 Psychology of Attitudes and Public Opinion (3)

Psychology of opinion formation, measurement of opinion, social determinants of attitudes, psychological processes in propaganda, bases of receptivity to propaganda, psychological warfare. First Session: MTWTh 7:35–9:15 pm.

191 Independent Research in Psychology (3)

Opportunity for work on individual library or experimental projects. Open to qualified students by permission; arrangements must be made with the sponsoring faculty member prior to registration. May be repeated once for credit. Both sessions.

196 History and Systems of Psychology (3)

Senior capstone course which includes a survey and integration of the major viewpoints and concepts of psychology. Required of Psychology majors. First Session: MTWThF 11:10 am–12:30 pm.

198 Current Research Issues in Psychology (3)

Topic for summer: recent experimental work and critical evaluation of issues related to the experimental and theoretical foundations of two-process learning theories. Conducted as a seminar. May be repeated for credit. First Session: MTWThF 1:10–2:30 pm.

215 Personality Assessment by Multiple Procedures (3)

Consideration and use of a wide range of procedures in assessment of personality and psychopathology of children. Prerequisite: Psyc 207–8 or 211 and 212. Graduate students in fields other than Psychology admitted by permission of instructor. Material fee, \$7. First Session: MWTh 6:10–8 pm.

218 Seminar: Systems of Psychotherapy (3)

Introduction to theory and technique of psychotherapeutic approaches: Psychoanalytic, ego-centered, nondirective, transactional, and others. Original sources surveyed. First Session: MWTh 4:10–6 pm.

219 Seminar: Topics in Advanced Clinical Psychology (3)

Topic for summer: an exploration of theory and research evidence for the biological basis of abnormal behavior, with special emphasis upon biochemical and genetic factors. May be repeated for credit. First Session: MWTh 4:10–6 pm.

246 Seminar: Personnel Measurement Techniques (3)

Detailed consideration of techniques of personnel selection and performance evaluation. Employment tests, personal data, assessment interviews, and performance ratings. First Session: MWTh 4:10–6 pm.

256 Seminar: Psychological Causes of War (3)

(Formerly Seminar: *Psychology of Group Conflict*)

An attempt to integrate evidence from animal behavior, child behavior, anthropology, psychiatry, and recent history, including World Wars I and

II and the present East-West conflict. Second Session: MWTh 4:10-6 pm.

283-84 Practicum in Clinical Psychology (3-3)

Supervised practical instruction in agencies doing clinical psychological work. Prerequisite: Psyc 212. Admission by permission of instructor. Both sessions.

295 Independent Research in Psychology (3)

Individual library or experimental research under supervision of staff member. Arrangements must be made with sponsoring faculty member prior to registration. May be repeated once for credit. Both sessions.

299-300 Thesis Research (3-3)

Both sessions.

398 Advanced Reading and Research (arr.)

Limited to students preparing for the Doctor of Philosophy general examination. May be repeated for credit. Both sessions.

399 Dissertation Research (arr.)

Limited to Doctor of Philosophy candidates. May be repeated for credit. Both sessions.

Public Administration

S.R. Chitwood, *Acting Chairman*

213 Administration in Government (3)

Critical analysis of federal administrative organizations as an integral part of the political system. Roles of Congress, the Presidency, the Courts, interest groups, political parties, and the public in the administrative process; special attention to centripetal and centrifugal forces. First Session: MWF 6:10-8 pm.

221 Management in the Executive Branch (3)

Analysis of application of management theory and practice in the Executive Branch of the Federal Government; emphasis on staff responsibilities and relationships and internal organization and control. Second Session: MWF 6:10-8 pm.

251 Governmental Budgeting (3)

Survey of the basic concepts, principles, and practices in governmental budgeting; interrelationship of planning, programming, and budgeting, and their role in the management process. Second Session: MWF 8:10-10 pm.

271 Readings and Research in Public Administration (3)

Advanced directed readings and research in specific areas of public administration. First Session.

299 Thesis Seminar (3)

Examination of thesis standards, research philosophy, and methodology. First Session: MWF 8:10-10 pm.

300 Thesis Research (3)

Second Session.

ReligionR.G. Jones, *Chairman***9 The Old Testament (3)**

Historical and literary study of the Old Testament with consideration of development of religious ideas, institutions, and outstanding personalities. First Session: MTWThF 9:40-11 am.

10 The New Testament (3)

Study of New Testament literature from the standpoint of occasion, purpose, dominant ideas, and permanent values. Emphasis on approach, structure, and significance of the Gospels and Epistles. Second Session: MTWThF 9:40-11 am.

59-60 History of Religions (3-3)

Origins, evolution, and contemporary status in historical context. Rel 59: primitive religion and the religions of the East (Hinduism, Buddhism, Taoism, Confucianism, Shinto). Rel 60: religions of the West and Near East (ancient religions, Judaism, Christianity, Islam). First Session: Rel 59; Second Session: Rel 60. MTWThF 11:10 am-12:30 pm.

104 The Life and Thought of Jesus (3)

Comprehensive study of the life and teachings of Jesus with critical attention to sources. First Session: MTWThF 1:10-2:30 pm.

160 Buddhism (3)

Origin, development, and contemporary status of Buddhist life and thought; its impact on Asian civilization. First Session: MTWTh 5:45-7:25 pm.

172 Religion in American Culture (3)

Growth of religious bodies and institutions in relation to American culture, development of religious thought, and analysis of the contemporary religious scene. Second Session: MTWTh 5:45-7:25 pm.

291-92 Readings and Research (3-3)

Investigation of special problems. First Session: Rel 291; Second Session: Rel 292.

299-300 Thesis Research (3-3)

Both sessions.

Slavic Languages and LiteraturesC.A. Moser, *Chairman*

Placement Examination: a standardized placement examination given before registration is required of all entering students who wish to continue in college the language begun in high school. Upon completion of the examination,

assignment is made to the appropriate course, with credit assigned on the usual basis.

1-2 First-year Russian (3-3)

A year course: credit toward a degree at this University given on completion of Slav 2. Beginners' course in fundamentals of grammar and pronunciation with graded reading, oral drill, and written practice. Listening comprehension and oral practice in language laboratory. Laboratory fee, \$17.50 a session. First Session: Slav 1; Second Session: Slav 2. Classroom—MTWThF 9:40-11 am, laboratory—MTh 11:10-12 am.

47 Beginning Russian for Reading Examination Candidates (0)

For graduate students with little or no knowledge of Russian who intend to use the language as a research tool. No academic credit. Tuition fee, \$204. First Session: MTWTh 5:45-7:25 pm.

49 Russian Readings for Nonmajor Students (3)

Primarily for graduate students preparing for reading examinations. Undergraduates admitted with permission of instructor. No academic credit for graduate students. Prerequisite: Slav 4, 8, or 47; or equivalent. Second Session: MTWTh 5:45-7:25 pm.

91-92 Introduction to Russian Literature (3-3)

Survey of Russian literature, in translation, from earliest periods through literary masterpieces of the 19th and early 20th centuries. Lecture, recitation, and discussion—in English. First Session: Slav 91; Second Session: Slav 92. MTWTh 7:35-9:15 pm.

Sociology

R.G. Brown, *Chairman*

Departmental prerequisite: Soc 1 and either 2 or 61 are prerequisite to all second- and third-group courses in Sociology.

1-2 Introductory Sociology (3-3)

Soc 1: general principles of sociology; development of culture and personality, impact of groups and institutions on man's social behavior. Survey of fields within sociology. Soc 2: analysis of major social problems confronting the United States; factors producing social problems, their nature and treatment. First Session: Soc 1A and 2A; Second Session: Soc 1B and 2B. MTWThF 9:40-11 am.

61 Development of Social Thought (3)

Examination of concepts and theories relevant to the nature of society and human relationships from ancient writings to the 20th century. First Session: Soc 61A; Second Session: Soc 61B. MTWThF 11:10 am-12:30 pm.

110 The Sociology of Work (3)

Introductory survey of industrial sociology; sociology of occupations and professions; industry-community relations; and analysis of large, complex organizations. First Session: MTWThF 11:10 am-12:30 pm.

124 Medical Sociology (3)

Sociological factors and processes which relate to physical and mental health and disease, analysis of patterned social relationships in the field of health and medicine, the hospital as a social system. First Session: MTWThF 8:10-9:30 am.

126 Urban Sociology (3)

Place of the city in larger society; growth of the city, problems of urban living, group life, personality, urban housing, city planning, and suburban development. First Session: MTWThF 9:40-11 am.

127 Population Problems (3)

Composition of populations, trends in population growth and population pressure, factors producing population movements, effects of migration, population policies—eugenics and birth control. First Session: MTWThF 11:10 am-12:30 pm.

135 Juvenile Delinquency (3)

Factors producing delinquency, juvenile detention, the juvenile court, training schools, treatment of offenders. Second Session: MTWThF 11:10 am-12:30 pm.

149 Modern Sociological Theory (3)

Systematic study of contemporary schools of sociological theory, both European and American development; evaluation of scientific contributions of each school. Prerequisite: Soc 61 or permission of instructor. Second Session: MTWThF 11:10 am-12:30 pm.

295 Research (3)

May be repeated once for credit. Both sessions.

299-300 Thesis Research (3-3)

Both sessions.

398 Advanced Reading and Research (arr.)

Limited to students preparing for the Doctor of Philosophy general examination. May be repeated for credit. Both sessions.

399 Dissertation Research (arr.)

Limited to Doctor of Philosophy candidates. May be repeated for credit. Both sessions.

Spanish

Administered by the Department of Romance Languages and Literatures, J.F. Burks, *Chairman*

Placement Examination: a standardized placement examination given before registration is required of all entering students who wish to continue in college the language begun in high school. Upon completion of the examination, assignment is made to the appropriate course, with credit assigned on the usual basis.

Departmental prerequisite: Span 3-4 or 6, or equivalent, is required (Span 51-52 is recommended) as prerequisite to all second-group courses in Spanish.

1-2 First-year Spanish (3-3)

A year course: credit toward a degree at this University given on completion of Span 2. For beginners. Pronunciation, conversation, grammar, composition, reading of modern Spanish prose. Aural training, oral practice in language laboratory. Laboratory fee, \$17.50 a session. First Session: Span 1; Second Session: Span 2. Classroom—MTWThF 11:10 am-12:30 pm, laboratory—MTh 9:40-10:30 am.

3-4 Second-year Spanish (3-3)

A year course: credit toward a degree at this University given on completion of Span 4. Conversation, grammar, composition, reading of modern Spanish prose, introduction to Hispanic civilization. Aural training, oral practice in language laboratory. Laboratory fee, \$17.50 a session. Prerequisite: Span 1-2, 2x, or two years of high school Spanish. First Session: Span 3; Second Session: Span 4. Classroom—MTWThF 9:40-11 am, laboratory—MTh 11:10-12 am.

12 Spanish Conversation and Composition (Intensive) (6)

Intensive, accelerated course which covers material of Span 9-10. Two class meetings and one laboratory meeting every day. Laboratory fee, \$25. First Session: Classroom—MTWThF 9:40-11 am and 1:10-2:30 pm, laboratory—MTWThF 9-9:30 am.

131 The Generation of 1898 (3)

Study of the various critical problems related to this renaissance of Spanish letters as a whole, and of its most representative figures and works. First Session: MTWThF 9:40-11 am.

141 Introduction to Spanish American Literature (3)

Highlights of Spanish American Literature through the colonial and modern periods. Given in English, with readings in Spanish. Of special interest to majors in Latin American Studies. First Session: MTWThF 1:10-2:30 pm.

145 Panoramic Vision of Mexico (3)

A panoramic vision of Mexico in its cultural, educational, scientific, political, and social aspects. First Session: MTWThF 1:10-2:30 pm.

193 Curso de estilo (3)

Advanced grammar, composition, and stylistics. Open to both advanced undergraduate and graduate students. Recommended for majors and teachers of Spanish. First Session: MTWThF 4:10-5:30 pm.

295 Independent Reading and Research in Spanish and Spanish American Literature (arr.)

For students preparing for the Master of Arts degree. May be repeated for credit. First Session.

299-300 Thesis Research (3-3)

Both sessions.

Special Education

Perry Botwin, *Chairman*

SIX-WEEK COURSES—JUNE 16 TO JULY 24

291 Practicum in Teaching Children with Behavioral Problems (6)

(Formerly Practicum in Teaching the Emotionally Disturbed)

Supervised student teaching in programs for children with behavioral problems under the direction of a qualified teacher and the supervision of the University staff. Minimum of 210 clock hours required. Admission by permission of instructor. As arranged.

292 Practicum in Teaching Young Children in Special Education (3)

(Formerly Practicum in Teaching Children with Crippling Conditions, Health Impairment, or Cerebral Palsy)

Supervised student teaching in special education in classrooms for young children. Minimum of 210 clock hours required. As arranged.

294 Practicum in Diagnostic and Prescriptive Teaching (6)

Supervised diagnostic and prescriptive teaching. Minimum of 210 clock hours required. Admission by permission of instructor. As arranged.

308 Instructional Media and Technology in Education: Past, Present, and Future Relationships and Implications (3)

A review and consideration of technological developments as they affect special education; consideration of operating principles of various kinds of hardware, including printing, audio-visual equipment, television, and computers; status of software for use with hardware. Admission by permission of instructor. MTWThF 10:10–12 am.

FIRST 3-WEEK EDUCATION WORKSHOP SESSION—JUNE 16 TO JULY 2

Classes meet Monday through Friday. Each workshop course requires the full day; concurrent registration for another daytime course is not permitted. June 16 to 19—small group discussions, evening; June 22 to July 2—small group discussions and field work, afternoon.

240 Educational Programming for Children with Behavioral Problems (3)

Analysis of educational provisions for children with behavioral problems through study of ecological considerations in the light of contemporary special education theory. Admission by permission of instructor. June 16 to 19: lecture 3:45–5:45 pm. June 22 to July 2: lecture 8:10–10 am; conference 10:10–11 am.

242 Clinical Teaching of Children with Behavioral Problems (3)

(Formerly Clinical Teaching of Emotionally Disturbed Children)

Lectures and discussions exploring various psychoeducational techniques of teaching children and adolescents with behavioral problems, interpersonal interaction between teachers and disturbed children, use of group factors in the teaching-learning process, and selection of appropriate teaching methods and materials. Admission by permission of instructor. June 16 to 19: lecture 3:45–5:45 pm. June 22 to July 2: lecture 10:10–12 am; conference 9:10–10 am.

250 Advanced Specialized Teaching Techniques and Materials (3)

Lectures and laboratory practice in advanced specialized teaching techniques and materials for diagnostic-prescriptive teaching. Admission by permission of instructor. Students who register for S Ed 250 must also register for S Ed 252 in the Second 3-Week Education Workshop Session. June 16 to 19: lecture 3:45–5:45 pm. June 22 to July 2: lecture 8:10–10 am; conference 10:10–11 am.

251 Psychosocial Considerations in Special Education (3)

Psychological and sociological factors in special education programs and practices. Admission by permission of instructor. June 16 to 19: lecture 3:45–5:45 pm. June 22 to July 2: lecture 8:10–10 am; conference 10:10–11 am.

306 Guidance and Counseling Families of Children with Special Needs (3)
(Formerly *Guidance and Counseling of Exceptional Children*)

Working with parents and community agencies in meeting the educational and social needs of young children. Admission by permission of instructor. June 16 to 19: lecture 3:45–5:45 pm. June 22 to July 2: lecture 10:10–12 am; conference 9:10–10 am.

491 Dissertation Research (arr.)**SECOND 3-WEEK EDUCATION WORKSHOP SESSION—JULY 6 TO JULY 24**

Classes meet Monday through Friday. Concurrent registration for another day-time course is not permitted, because each workshop course requires the full day—lecture and conference in the morning; small group discussion and field work or laboratory in the afternoon.

201 Introduction to Special Education (3)

(Formerly *Introduction to the Education of Exceptional Children*)

Survey course to acquaint prospective teachers with special education and to help them become aware of the various educational modifications necessary to accommodate children in a school program. Lecture 10:10–12 am; conference 9:10–10 am.

252 Professional Internship: Special Education (3)

Supervised school internship in diagnostic-prescriptive teaching. Admission by permission of instructor. Students who register for S Ed 252 must also register for S Ed 250 in the First 3-Week Education Workshop Session. Lecture 8:10–10 am; conference 10:10–11 am.

350 Diagnostic and Prescriptive Teaching (3)

Theory and practice in diagnostic and prescriptive teaching. Rationale, models, techniques, and problems relevant to implementation. Admission by permission of instructor. Lecture 8:10–10 am; conference 10:10–11 am.

370 Intrapersonal Dynamics in Special Education (3)

Small group exploration of intrapersonal factors essential to understanding roles and interpersonal techniques in teaching exceptional children. Admission by permission of instructor. Lecture 8:10–10 am; conference 10:10–11 am.

491 Dissertation Research (arr.)

THIRD 3-WEEK WORKSHOP SESSION—JULY 27 TO AUGUST 14

Classes meet Monday through Friday. Concurrent registration for another day-time course is not permitted, because each workshop course requires the full day—lectures and conference in the morning; small group discussion and field work or laboratory in the afternoon.

342 Seminar: Crisis/Resource Teaching (3)

(Formerly Advanced Seminar: Emotional Disturbance)

Topics and concepts relevant to an exploration of alternative models in the education of children with behavioral problems. Admission by permission of instructor. Lecture 10:10–12 am; conference 9:10–10 am.

491 Dissertation Research (arr.)

Speech and Drama

G.F. Henigan, *Chairman*

1 Communicative Speaking and Listening (3)

(Formerly Effective Speaking)

Basic theories and principles of speech communication; composition, delivery, and criticism of speaking in interpersonal, group, and public situations. Recording fee, \$2. First Session: Section A—MTWThF 1:10–2:30 pm; Section B—MTWTh 5:45–7:25 pm. Second Session: Section C—MTWThF 9:40–11 am.

11 Voice and Diction (3)

Development of naturalness, correctness, and clarity in conversational speech. Analysis and correction of individual speech delivery faults through tapes and weekly performances. Class instruction on concepts of acceptable voice and diction standards. Recording fee, \$4. First Session: Section A—MTWThF 9:40–11 am. Second Session: Section B—MTWThF 11:10 am–12:30 pm.

32 Oral Interpretation of Literature (3)

(Formerly Oral Reading)

Theory and practice in discovering and communicating orally the meaning in literature through analysis of form and content. Techniques of reading prose, poetry, and drama for listeners. Prerequisite: Sp&D 11. Recording fee, \$2. First Session: MTWThF 11:10 am–12:30 pm.

45 Introduction to the Theater (3)

The art of the theater; its literature, aesthetics, and mechanics. Contributions of the playwright, actor, director, and designer examined through lectures, visiting artists, class discussions, and attendance at theatrical performances. Primarily for nonmajors. Second Session: MTWThF 1:10–2:30 pm.

123 Training the Student Advocate: Special Events (2)

A 2-week course, June 22 to July 2: MTWThF 9:40 am–12:30 pm. (See Forensics Workshops, pages 37–38.)

124 Training the Student Advocate: Debate (3)

A 3-week course, July 6 to July 24: MTWThF 9:40 am–12:30 pm. (See Forensics Workshops, pages 37–38.)

155–56 Play Production Practice (1–1)

Practical work in theater, including assigned production duties and special projects under supervision of instructor. Admission by permission of instructor. First Session: Sp&D 155; Second Session: Sp&D 156. As arranged.

169 Introduction to Creative Dramatics (3)

Study of philosophies and practices underlying dramatics with children; materials and methods for conducting improvised dramatic activities in elementary and secondary education. Students lead classes of children. First Session: MTWThF 4:10–5:30 pm.

184 Clinical Practice in Speech and Hearing (1)

Supervised case work in speech and hearing in the University Speech and Hearing Clinic and selected off-campus facilities. May be repeated for a total of 3 semester hours. Prerequisite or concurrent registration: Sp&D 183. Both sessions.

277 Advanced Clinical Procedures in Speech and Hearing (3)

June 22 to July 24: MTWTh 1–2:40 pm. (See Summer Institute in Speech Pathology and Audiology, pages 40–41.)

278 Advanced Clinical Practice in Speech and Hearing (arr.)

Both sessions.

281 Advanced Clinical Audiology (3)

June 22 to July 24: MTWTh 11:10 am–12:50 pm. (See Summer Institute in Speech Pathology and Audiology, pages 40–41.)

291 Seminar: Speech Pathology (3)

Offered in such areas as articulatory problems and delayed speech, aphasia, voice difficulties and cleft palate, stuttering, cerebral palsy, and allied disorders. May be repeated for credit. June 22 to July 24: Section A—MTWTh 9:20–11 am (see Summer Institute in Speech Pathology and Audiology, pages 40–41). Second Session: Section B—as arranged.

292 Seminar: Audiology (3)

June 22 to July 24: MTWTh 2:50–4:30 pm. (See Summer Institute in Speech Pathology and Audiology, pages 40–41.)

294 Independent Research in Dramatic Art (arr.)

May be repeated for credit. Both sessions.

295 Independent Research in Speech and Hearing (arr.)

May be repeated for credit. Both sessions.

299–300 Thesis Research (3–3)

Both sessions.

For information concerning special program in Speech Pathology and Audiology and Forensics Workshops, see pages 37-38, 40-41.

Statistics

Solomon Kullback, *Chairman*

Departmental prerequisite: one entrance unit in algebra is prerequisite to all first-group courses in Statistics.

Stat 51, 53, and 91 are related in their subject matter, and credit hours for only one of the three may be applied toward a degree. Stat 52 lies outside of this group, and may be taken for degree credit in combination with any one of the other three.

49 The Language of Statistics (0)

For doctoral students as a minimum option in lieu of a foreign language. No academic credit. Tuition fee, \$272. Second Session: MWF 9:10-12 am.

51 Introduction to Business and Economic Statistics (3)

Frequency distributions, descriptive measures, probability, sampling, estimation, tests of hypotheses, correlation, time series, index numbers. Laboratory fee, \$9. First Session: lecture MTWThF 9:40-11 am, laboratory as arranged.

53 Introduction to Statistics in Psychology and Education (3)

Frequency distributions, descriptive measures, probability, sampling, estimation, tests of hypotheses, correlation, analysis of variance. Laboratory fee, \$9. First Session: lecture MTWThF 4:10-5:30 pm, laboratory as arranged.

91 Principles of Statistical Methods (3)

Variables and attributes, averages and dispersion, frequency distributions and their characteristics, regression and correlation, statistical decision processes. Laboratory fee, \$9. First Session: lecture MTWThF 1:10-2:30 pm, laboratory as arranged.

97 Introduction to Computer Programming (3)

Computer and programming concepts. High-level language programs written by students will be run on the University computer. Laboratory fee, \$20. First Session: lecture MWF 6-7:20 pm, laboratory TTh 6-7:20 pm.

*104 Statistics in the Behavioral Sciences and Education I (3)

Introductory study of statistical techniques for research problems in behavioral sciences and education. Laboratory fee, \$9. First Session: lecture MWF 6-7:20 pm, laboratory TTh 6-7:20 pm.

* May not be taken for credit by students who have received credit for Stat 51, 53, or 91.

107 Statistics for Engineers (3)

Probability models, discrete and continuous distributions, sampling, hypothesis testing and estimation, engineering applications. Prerequisite: differential and integral calculus. An 8-week course, June 16 to August 7: MW 5:45-8:15 pm.

118 Regression Analysis (3)

Regression and correlation theory: simple, partial, and multiple. Prerequisite: 3 semester hours selected from Stat 51, 53, 91, 104, 107. Laboratory fee, \$9. First Session: lecture MWF 3:10-5 pm, laboratory MW 5:10-6 pm.

119 Bases of Statistical Decision Making (arr.)

For students in the Navy Graduate Financial Management Program only. Introduction to techniques of decision making, with emphasis on applications rather than theory. Includes: binomial distribution, normal distribution, Type I and II errors, estimation, research methodology, and problems of inference. June 8 to July 31: as arranged.

131 Contingency Table Techniques (3)

Analysis of categorical data. Tests of independence, homogeneity, and interaction in simple and complex contingency tables. Tests of goodness of fit and of Markovity. Prerequisite: Stat 105 or 118, or permission of instructor. An 8-week course, June 16 to August 7: TTh 3-5:30 pm.

155 Introduction to Probability (3)

Probability distributions, Bayes' theorem and postulate, Bernoulli's theorem and its experimental verification, mathematical expectation, laws of large numbers. Prerequisite: one entrance unit in algebra. First Session: MWF 5:30-8 pm.

296 Seminar: Professional Consulting in Statistics (3)

Case studies, data analysis procedures, and problems that a consultant might encounter. Second Session: MWF 1:30-4 pm.

298 Seminar: Combinatorial Probability (3)

An 8-week course, June 16 to August 7: MW 4:10-6 pm.

299-300 Thesis Research (3-3)

Both sessions.

399 Dissertation Research (arr.)

Limited to Doctor of Philosophy candidates. May be repeated for credit. Both sessions.

Urban and Regional Planning

D.C. McGrath, Jr., *Chairman*

53 Principles of Urban Planning and Design (3)

An introductory studio course for undergraduates. Basic elements of urban planning and design theory, techniques, and practice are studied through classroom and field problems supplemented by seminars and

lectures. Students are taught the use of elementary graphic techniques in urban problem analysis and presentation of proposals. The course is intended to provide an initial survey of planner's role and responsibilities in developing and implementing creative solutions to contemporary urban problems. Admission by permission of instructor. First Session: MT Th 1:10-4 pm.

201 Introduction to Urban Planning (3)

Introduction to history, concepts, and activities of urban planning. Discussion of trends in urbanism and the influences of technical and social change. First Session: TTh 6:10-9 pm.

205 Seminar: Urban Housing (3)

Consideration of housing problems growing out of increasing urban population. Social, economic, and design aspects of today's housing; foreign and domestic housing programs and policies. First Session: Section A; Second Session: Section B. MW 6:10-9 pm.

299-300 Thesis Research (3-3)

Both sessions.

HOURLY SCHEDULE*

FIRST SESSION, JUNE 15 TO JULY 22

MORNING CLASSES

8:00	9:00	9:40
P E 4A (to 9)	Art 191 (to 12)	Hist 182 (to 11)
8:10	Art 279 (to 12)	Jour 111 (to 11)
Art 32 (to 9:30)	Art 280 (to 12)	Math 15 (to 11)
Art 106 (to 9:30)	Art 281 (to 12)	Math 122 (to 11)
Chem 11 (MWF to 1; TTh to 11:10)	†Chin 5 lect (to 11:45)	Mus 106 (to 11)
Chem 22 (to 12:30)	Fren 6 tutor (to 9:30)	Phil 172 (to 11)
Chem 51 (to 9:40)	Span 12 (lab to 9:30)	Phys 1A lab (MWF to 12)
Engl 127 (to 9:30)	9:10	P Sc 107 (to 11)
Hist 39 (to 9:30)	Econ 217 (TThF to 11)	P Sc 126 (to 11)
Math 9A (to 9:30)	9:20	P Sc 145 (to 11)
Phil 162 (to 9:30)	‡Sp&D 291A (MTWTh to 11)	P Sc 194 (to 11)
Phys 1A rec (WF to 9:30)	9:40	Psyc 8 (to 11)
P Sc 101 (to 9:30)	Acct 1A (to 11)	Psyc 121 (to 11)
P Sc 103 (to 9:30)	Anth 1 (to 11)	Rel 9 (to 11)
Psyc 1A (to 9:30)	Art 31 (to 11)	Slav 1 lect (to 11)
Soc 124 (to 9:30)	Art 114 (to 11)	Soc 1A (to 11)
9:00	B Sc 11 (to 1)	Soc 2A (to 11)
Art 41A (to 12)	B Sc 148 (to 1)	Soc 126 (to 11)
Art 42A (to 12)	Clas 108 (to 11)	Span 1 lab (MTh to 10:30)
Art 61 (to 12)	Econ 1A (to 11)	Span 3 lect (to 11)
Art 65A (to 12)	Engl 51 (to 11)	§Span 12 lect (to 11)
Art 66A (to 12)	Engl 123 (to 11)	Span 131 (to 11)
Art 81 (to 12)	Engl 164 (to 11)	Sp&D 11A (to 11)
Art 82 (to 12)	Fren 1 lect (to 11)	Sp&D 123 (to 12:30)
Art 137 (to 12)	§Fren 6 lect (to 11)	#Sp&D 124 (to 12:30)
Art 143 (to 12)	Geog 52 (to 11)	¶Stat 51 lect (to 11)
Art 157A (to 12)	Geol 1 (MTWTh to 1)	9:50
Art 158 (to 12)	Geol 147 (MTWTh to 12:45)	Chem 53 (MWF to 1)
Art 179 (to 12)	Hist 71A (to 11)	10:00
Art 180 (to 12)	Hist 176 (to 11)	P E 4B (to 11)
Art 189 (to 12)		
Art 190 (to 12)		

* Classes meet Monday through Friday unless otherwise indicated. Seminars and research courses for which hours are to be arranged, and courses in the School of Education will be found under the departmental announcements.

† June 15 to July 17.

‡ June 22 to July 24.

§ Five classroom meetings 9:40–11 am; five classroom meetings 1:10–2:30 pm.

|| June 22 to July 2.

July 6 to July 24.

¶ Laboratory as arranged.

MORNING CLASSES (Continued)

11:10	11:10	11:10
AmCv 161 (to 12:30)	Fren 109 (to 12:30)	P Sc 112 (to 12:30)
Anth 170 (to 12:30)	Geog 172 (to 12:30)	P Sc 189 (to 12:30)
Art 71 (to 12:30)	Hist 40A (to 12:30)	Psyc 196 (to 12:30)
Art 113 (to 12:30)	Hist 113 (to 12:30)	Rel 59 (to 12:30)
Clas 1 (to 12:30)	Hist 275 (MWF to 1)	Slav 1 lab (MTh to 12)
Clas 141 (to 12:30)	Jour 150 (to 12:30)	Soc 61A (to 12:30)
Econ 102 (to 12:30)	Math 31A (to 12:30)	Soc 110 (to 12:30)
Econ 181 (to 12:30)	Mus 4 (to 12:30)	Soc 127 (to 12:30)
Engl 1 (to 12:30)	Phil 61 (to 12:30)	Span 1 lect (to 12:30)
Engl 135 (to 12:30)	Phil 193 (to 12:30)	Span 3 lab (MTh to 12)
Engl 161 (to 12:30)	P Sc 5A (to 12:30)	Sp&D 32 (to 12:30)
Fren 1 lab (MTh to 12)	P Sc 6A (to 12:30)	*Sp&D 281 (to 12:50)

AFTERNOON CLASSES

12:45	1:10	2:50
†Chin 5 tutor (to 1:35)	B Ad 51 (MTWTh to 2:50)	*Sp&D 292 (MTWTh to 4:30)
1:00	Engl 171 (to 2:30)	3:00
Art 21A (to 4)	‡Fren 6 lect (to 2:30)	Hist 341 (TTh to 5:40)
Art 22A (to 4)	Fren 130 (to 2:30)	Stat 131 (TTh to 5:30)
Art 41B (to 4)	Geog 146 (to 2:30)	3:10
Art 42B (to 4)	Hist 193 (to 2:30)	E Ad 212 (MW to 5:40)
Art 51A (to 4)	Hist 286 (MWF to 3)	Phys 1B lab (MWF to 5:30)
Art 52A (to 4)	Phys 1A lect (MTTh to 3)	Stat 118 lect (MWF to 5)
Art 125A (to 4)	Phys 1B lect (MTTh to 3)	4:10
Art 126A (to 4)	Phys 1B rec (WF to 2:30)	Art 148 (to 5:30)
Art 127A (to 4)	Psyc 29 (to 2:30)	B Ad 118 (MTWTh to 5:50)
Art 128A (to 4)	Psyc 101A (to 2:30)	B Ad 283 (MWF to 6)
Art 131A (to 4)	Psyc 198 (to 2:30)	B&PA 201A (MWF to 6)
Art 132A (to 4)	Rel 104 (to 2:30)	B&PA 203A (MWF to 6)
Art 144 (to 4)	‡Span 12 lect (to 2:30)	EE 153 (MW to 6:40)
Art 161 (to 4)	Span 141 (to 2:30)	EE 154 (TTh to 6:40)
Art 171A (to 4)	Span 145 (to 2:30)	EE 184 (MW to 6:40)
Art 265A (to 4)	Sp&D 1A (to 2:30)	EE 271 (TTh to 6:40)
Art 266A (to 4)	§Stat 91 lect (to 2:30)	Engl 173 (to 5:30)
Art 275 (to 4)	U&RP 53 (MTTh to 4)	Fren 193 (to 5:30)
*Sp&D 277 (to 2:40)	1:30	Fren 256 (MWTh to 6)
1:10	P Sc 190 (to 2:50)	
AmCv 181 (to 2:30)	1:45	
Art 1 (to 2:30)	†Chin 5 lab (to 2:35)	
Art 119 (to 2:30)		

* June 22 to July 24.

† June 15 to July 17.

‡ Five classroom meetings 9:40–11 am; five classroom meetings 1:10–2:30 pm.

§ Laboratory as arranged.

|| June 16 to August 7.

AFTERNOON CLASSES (Continued)

4:10	4:10	5:00
Hist 138 (to 5:30)	Psyc 218 (MWTh to 6)	Germ 1M lab (MTh to 5:50)
Mus 1A (to 5:30)	Psyc 219 (MWTh to 6)	Germ 3M lab (MTh to 5:50)
P Sc 160 (to 5:30)	Psyc 246 (MWTh to 6)	
Psyc 1B (to 5:30)	Span 193 (to 5:30)	
Psyc 110 (to 5:30)	Sp&D 169 (to 5:30)	
Psyc 115 (to 5:30)	*Stat 53 lect (to 5:30)	5:10
Psyc 131 (to 5:30)	†Stat 298 (MW to 6)	Stat 118 lab (MW to 6)

EVENING CLASSES

5:30	6:00	6:10
Stat 155 (MWF to 8)	Acct 1B (to 7:20)	Hist 387 (MWF to 8)
5:45	Acct 115A (MWF to 8:25)	†ME 131 (TTh to 8:40)
Acct 171 (MTWTh to 7:25)	Acct 121 (to 7:20)	Psyc 145 (MWTh to 8)
Art 21B (MTWTh to 7:25)	Acct 193 (to 7:20)	Psyc 215 (MWTh to 8)
B Ad 105 (MTWTh to 7:25)	B Sc 3 (MTW to 9; Th to 7)	P Ad 213 (MWF to 8)
B Ad 141 (MTWTh to 7:25)	B Sc 127 (to 8:50)	U&RP 201 (TTh to 9)
Econ 1B (MTWTh to 7:25)	Fren 49 (to 7:20)	U&RP 205A (MW to 9)
EE 243 (MTWTh to 7:25)	Germ 1 lect (to 7:20)	6:30
Engl A (MTWTh to 7:25)	Hist 72A (to 7:20)	Art 41C (to 9:30)
Engl 71 (MTWTh to 7:25)	Hist 116 (to 7:20)	Art 42C (to 9:30)
Germ 47A (MTWTh to 7:25)	Hist 150 (to 7:20)	Art 51B (to 9:30)
Mus 3A (MTWTh to 7:25)	Math 3 (to 7:20)	Art 52B (to 9:30)
P Sc 117 (MTWTh to 7:25)	Math 32A (to 7:20)	Art 65B (to 9:30)
P Sc 163 (MTWTh to 7:25)	Math 139 (to 7:20)	Art 66B (to 9:30)
Psyc 151A (MTWTh to 7:25)	Math 270 (to 7:20)	Art 125B (to 9:30)
Rel 160 (MTWTh to 7:25)	Stat 97 lect (MWF to 7:20)	Art 126B (to 9:30)
Slav 47 (MTWTh to 7:25)	Stat 97 lab (TTh to 7:20)	Art 127B (to 9:30)
Sp&D 1B (MTWTh to 7:25)	Stat 104 lect (MWF to 7:20)	Art 128B (to 9:30)
†Stat 107 (MW to 8:15)	Stat 104 lab (TTh to 7:20)	Art 131B (to 9:30)
	6:10	Art 132B (to 9:30)
	†Ap S 59 (MW to 9:30)	Art 159 (to 9:30)
	†Ap S 211 (MW to 8:40)	Art 160 (to 9:30)
	B Ad 241 (MWF to 8)	Art 171B (to 9:30)
	B Ad 257 (MWTh to 8)	Art 172 (to 9:30)
	B&PA 207A (MWF to 8)	Art 265B (to 9:30)
	B&PA 221 (MWF to 8)	Art 266B (to 9:30)
	Econ 218 (MWTh to 8)	Germ 3N lab (MTh to 7:20)
	Econ 391 (MWTh to 8)	7:30
	†E Ad 115 (MW to 8:40)	Germ 1N lab (MTh to 8:20)
	†E Ad 211 (TTh to 8:40)	

* Laboratory as arranged.

† June 16 to August 7.

EVENING CLASSES (Continued)

7:35	7:35	8:10
Art 22B (MTWTh 9:15)	Math 111 (to 8:55)	Acct 215A (MWF to 10)
Art 147 (MTWTh to 9:15)	Math 157 (to 8:55)	Acct 299 (MWF to 10)
B Ad 161 (MTWTh to 9:15)	P Sc 111 (MTWTh to 9:15)	B Ad 298 (MWF to 10)
Engl B (MTWTh to 9:15)	P Sc 161 (MTWTh to 9:15)	B Ad 299 (MWF to 10)
Germ 3 lect (to 8:55)	Psyc 156 (MTWTh to 9:15)	B&PA 201B (MWF to 10)
Germ 47B (MTWTh to 9:15)	Slav 91 (MTWTh to 9:15)	B&PA 204A (MWF to 10)
Math 30A (to 8:55)		P Ad 299 (MWF to 10)

SECOND SESSION, JULY 23 TO AUGUST 28

MORNING CLASSES

8:10	9:40	11:10
Chem 12 (MWF to 1; TTh to 11:10)	Engl 52 (to 11)	Anth 155 (to 12:30)
Chem 52 (to 9:40)	Engl 166 (to 11)	Art 105 (to 12:30)
Econ 101 (to 9:30)	Fren 2 lect (to 11)	Art 112 (to 12:30)
Engl 128 (to 9:30)	†Fren 12 lect (to 11)	Clas 2 (to 12:30)
Hist 40B (to 9:30)	Geol 2 (MTWTh to 1)	Econ 182 (to 12:30)
Hist 185 (to 9:30)	Hist 72B (to 11)	Engl 40 (to 12:30)
Math 10 (to 9:30)	Math 16 (to 11)	Engl 178 (to 12:30)
Phys 2A rec (WF to 9:30)	Math 30B (to 11)	Fren 2 lab (MTh to 12)
P Sc 104 (to 9:30)	Phil 192 (to 11)	Fren 110 (to 12:30)
	Phys 2A lab (MWF to 12)	Geog 125 (to 12:30)
	P Sc 5B (to 11)	Hist 139 (to 12:30)
	Psyc 1C (to 11)	Math 32B (to 12:30)
	Psyc 151B (to 11)	Mus 3B (to 12:30)
	Rel 10 (to 11)	Phil 62 (to 12:30)
	Slav 2 lect (to 11)	P Sc 6B (to 12:30)
	Soc 1B (to 11)	P Sc 121 (to 12:30)
	Soc 2B (to 11)	P Sc 177 (to 12:30)
	Span 2 lab (MTh to 10:30)	Rel 60 (to 12:30)
	Span 4 lect (to 11)	Slav 2 lab (MTh to 12)
	Sp&D 1C (to 11)	Soc 61B (to 12:30)
		Soc 135 (to 12:30)
		Soc 149 (to 12:30)
		Span 2 lect (to 12:30)
		Span 4 lab (MTh to 12)
		Sp&D 11B (to 12:30)
	9:50	
	Chem 54 (MWF to 1)	

* July 20 to August 21.

† Five classroom meetings 9:40–11 am; five classroom meetings 1:10–2:30 pm.

AFTERNOON CLASSES

12:45	1:10	3:10
*Chin 6 tutor (to 1:35)	Phys 2A lect (MTTh to 3)	B Ad 131 (MTWTh to 4:50)
1:00	Phys 2B lect (MTTh to 3)	Phys 2B lab (MWF to 5:30)
Art 157B (to 4)	Phys 2B rec (WF to 2:30)	
Art 231 (to 4)	P Sc 171 (to 2:30)	4:10
1:10	P Sc 181 (to 2:30)	Art 207 (to 5:30)
AmCv 182 (to 2:30)	Psyc 22B (to 2:30)	B Ad 279 (MWF to 6)
Art 72 (to 2:30)	Sp&D 45 (to 2:30)	B&PA 204B (MWF to 6)
Art 246 (to 2:30)	1:30	Engl 152 (to 5:30)
B Ad 102 (MTWTh to 2:50)	Stat 296 (MWF to 4)	Engl 234 (MWTh to 6)
Econ 1C (to 2:30)	1:45	Hist 157 (to 5:30)
Engl 112 (to 2:30)	*Chin 6 lab (to 2:35)	Hist 187 (to 5:30)
Engl 170 (to 2:30)	2:10	Math 9B (to 5:30)
†Fren 12 lect (to 2:30)	Hist 371 (TTh to 5)	Psyc 256 (MWTh to 6)
Geog 145 (to 2:30)		5:00
Hist 291 (TTh to 4)		Germ 2M lab (MTh to 5:50)
Mus 1B (to 2:30)		Germ 4M lab (MTh to 5:50)
Phil 111 (to 2:30)		

EVENING CLASSES

5:45	5:45	6:10
B Ad 191 (MTWTh to 7:25)	Rel 172 (MTWTh to 7:25)	Acct 215B (MWF to 8)
Econ 2B (MTWTh to 7:25)	Slav 49 (MTWTh to 7:25)	B Ad 237 (MWF to 8)
Econ 121 (MTWTh to 7:25)	6:00	B&PA 201C (MWF to 8)
EE 244 (MTWTh to 7:25)	Acct 2B (to 7:20)	B&PA 211 (MWF to 8)
Engl 72 (MTWTh to 7:25)	Acct 115C (MWF to 8:25)	B&PA 218 (MWF to 8)
Germ 49A (MTWTh to 7:25)	B Sc 4 (MTW to 9; Th to 7)	Engl 268 (MWTh to 8)
P Sc 118 (MTWTh to 7:25)	B Sc 145 (to 8:50)	Hist 396 (MWF to 8)
Psyc 1D (MTWTh to 7:25)	Germ 2 lect (to 7:20)	P Ad 221 (MWF to 8)
Psyc 101B (MTWTh to 7:25)	Hist 71B (to 7:20)	U&RP 205B (MW to 9)
	Math 6 (to 7:20)	6:30
	Math 33 (to 7:20)	Germ 4N lab (MTh to 7:20)
	Math 107 (to 7:20)	7:30
	Math 140 (to 7:20)	Germ 2N lab (MTh to 8:20)

* July 20 to August 21.

† Five classroom meetings 9:40–11 am; five classroom meetings 1:10–2:30 pm.

EVENING CLASSES (*Continued*)

7:35	7:35	8:10
B Ad 162 (MTWTh to 9:15)	Math 112 (to 8:55)	B Ad 209 (MWF to 10)
Germ 4 lect (to 8:55)	Math 113 (to 8:55)	B Ad 231 (MWF to 10)
Germ 49B (MTWTh to 9:15)	Psyc 129 (MTWTh to 9:15)	B&PA 203B (MWF to 10)
Math 31B (to 8:55)	Slav 92 (MTWTh to 9:15)	B&PA 207B (MWF to 10)
Math 34 (to 8:55)		B&PA 222 (MWF to 10)
		P Ad 251 (MWF to 10)

ANNUAL ISSUES OF THE UNIVERSITY BULLETIN

Requests for the following publications must include your zip code and should be addressed as indicated.

- COLLEGE OF GENERAL STUDIES, Dean of the College
- NATIONAL LAW CENTER, Dean of the Center
- SCHOOL OF ENGINEERING AND APPLIED SCIENCE, Dean of the School
- UNDERGRADUATE AND GRADUATE CATALOGUE (Arts and Sciences, Education, Government and Business Administration, Public and International Affairs), Office of Admissions
- SCHOOL OF MEDICINE, Admissions Office, School of Medicine
- SUMMER SESSIONS, Dean of the Summer Sessions
- SCHEDULE OF CLASSES: FALL AND SPRING SEMESTERS, Registrar
- SCHEDULE OF CLASSES: SUMMER SESSIONS, Dean of the Summer Sessions

APPENDIX: RECENTLY ESTABLISHED REGULATIONS

THE FOLLOWING UNIVERSITY REGULATIONS are under review and may be subject to change in connection with the establishment of judicial processes. Bulletins and handbooks incorporating any changes will be issued as appropriate.

The following resolution, submitted by the University Senate, was approved by the University's Board of Trustees on October 19, 1968:

Whereas, safety and order are essential preconditions of the learning process, and indeed of the very concept of a university; and

Whereas, The George Washington University is committed to protection of free speech and freedom of assembly, and to safeguarding the right of lawful protest on campus; and is committed equally to maintaining the peace and safety of the campus, in the knowledge that all rights are in jeopardy when violence and civil disorder prevail over law and reason;

Now, therefore, be it resolved by the Senate of The George Washington University: that in the event a demonstration at this University exceeds the bounds of free assembly and lawful advocacy, and demonstrators are engaging in unlawful acts which cause or imminently threaten injury to persons or property, or which obstruct or interfere with normal and necessary University activities, this body affirms the authority of the President, or other University officials designated to act in his absence, to take such reasonable steps, if possible after consultation with the Chairman of the Executive Committee of the University Senate and the President of the Student Body, as are required to restore and preserve order; including, if deemed necessary and appropriate, suspension of students or faculty engaging in such acts, and use of such law enforcement personnel as are needed to effect the removal, arrest, and prosecution of law violators. Any such suspension shall be reviewed by an appropriate tribunal as soon after order is restored as is practicably possible.

The following was approved by the University's Board of Trustees on October 19, 1968:

Any student suspended from The George Washington University on the grounds of exceeding the bounds of free assembly and lawful advocacy shall have his suspension reviewed by the Hearing Committee on Student Affairs of The George Washington University as soon after order is restored as is practicably possible.

The following resolution, submitted by the Student Life Committee, was approved by the University's Board of Trustees on October 19, 1968:

Be it resolved that The George Washington University: affirms its traditional commitment to freedom of expression (a) by continuing to permit business and government organizations which are recruiting employees to conduct their activities at designated places on campus, and (b) by placing no obstacle to students who may wish to protest the presence of such recruiters, provided, however, that such protest shall be orderly and shall not impede or disrupt the recruiter in his activities.

The University affirms its place as a forum for the free exchange of ideas (a) by assuring that guests invited to speak on this campus at duly scheduled meetings shall have the right to appear and to be heard, and (b) by sanctioning the freedom of students to express dissent from the views of the speaker, provided, however, that that expression of dissent be orderly and nonobstructive.

The University distinguishes between orderly protest and resistance-by-obstruction; it accepts the former as a legitimate expression of dissent while rejecting the latter as an abridgement of the freedoms of the individuals who may be its object.

The following was approved by the University's Board of Trustees on October 19, 1968:

The George Washington University is opposed to discrimination based on race, color, or creed. Such discrimination may have appeared in campus organizations in the past. In the future, however, no organization can be recognized or supported by the University unless it provides continued assurance of nondiscrimination in membership practices and in intent, considered adequate by relevant committees and officers of the University.

The following was approved by the University's Board of Trustees on October 19, 1968:

The University cannot condone violations of law, including violation of those laws which proscribe possession, use, sale, or distribution of certain drugs. Members of the academic community should know that administrative action, which may include dismissal from the residence halls, revocation of other privileges, or suspension or dismissal from the University, may be taken in order to protect the interests of the University and the rights of others.

The Board of Trustees reaffirms the responsibility of the President and the Faculty to continue to implement this policy.

The following resolution, submitted by the University Senate, was approved by the University's Board of Trustees on January 16, 1969:

Be it resolved by the Senate of The George Washington University: Any member of the University (including as members of the University all persons having a formal connection with the University)

(a) who engages in conduct that unreasonably obstructs teaching, research, and learning, or

(b) who unreasonably obstructs free access to members or guests of the University or to University buildings, or

(c) who disobeys general regulations of the University, or

(d) who damages University property or injures members or guests of the University,

may be punished for his conduct by dismissal from the University, or by some lesser disciplinary action, through procedures established within the University for the government of its members.

In order to insure due process, any student subject to dismissal or other disciplinary action on the grounds of violating any of the premises of this resolution shall have, at his discretion, the right of review of the action by the University Hearing Committee on Student Affairs.

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Students registered at George Washington University during the spring semester 1970 should not apply for admission to the Summer Sessions, but should report on June 15 to the first floor of the University Library, where detailed information and the necessary registration materials will be provided.

REQUEST FOR APPLICATION FOR ADMISSION TO 1970 SUMMER SESSIONS

I am a ☐ student at another college wishing to earn credit for transfer.

I am a ☐ new student or former GWU student (prior to the 1970 Spring Semester) wishing to be admitted or readmitted to:

- ☐ Nondegree status at GWU
- ☐ Bachelor's degree program
- Graduate degree program in:
 - ☐ Arts & Sciences
 - ☐ Business & Public Administration
 - ☐ Education
 - ☐ Engineering & Applied Science
 - ☐ Public & International Affairs
 - National Law Center
- ☐ J.D. program ☐ Post-J.D. program

Mail application form to:

Mr.
Mrs.
Miss

No. Street

City State Zip Code

Place a 5¢
Stamp Here

DEAN OF THE SUMMER SESSIONS
GEORGE WASHINGTON UNIVERSITY
WASHINGTON, D. C. 20006

COLLEGES AND SCHOOLS—DEGREE PROGRAMS

COLUMBIAN COLLEGE OF ARTS AND SCIENCES: Associate in Arts (A.A.), Bachelor of Arts (B.A.), Bachelor of General Studies (B.Gen.Std.), Bachelor of Science (B.S.), Bachelor of Science in Environmental Health (B.S. in Env.Health), Bachelor of Science in Geodetic and Cartographic Science (B.S. in Geod. and Cart.Sc.), Bachelor of Science in Medical Technology (B.S. in Med.Tech.), and Bachelor of Science in Oceanography (B.S. in Ocea.)

GRADUATE SCHOOL OF ARTS AND SCIENCES: Master of Arts (M.A.), Master of Fine Arts (M.F.A.), Master of Music (Mus.M.), Master of Science (M.S.), Master of Science in Forensic Science (M.S. in Forens.S.), and Doctor of Philosophy (Ph.D.)

SCHOOL OF MEDICINE: Doctor of Medicine (M.D.)

NATIONAL LAW CENTER: Juris Doctor (J.D.), Master of Laws (LL.M.), Master of Comparative Law (M.Comp.L.), Master of Comparative Law (American Practice) (M.Comp.L.(Am.Prac.)), and Doctor of Juridical Science (S.J.D.)

SCHOOL OF ENGINEERING AND APPLIED SCIENCE: Bachelor of Science (Civil Engineering) (B.S. (C.E.)), Bachelor of Science (Electrical Engineering) (B.S. (E.E.)), Bachelor of Science (Measurement Science) (B.S. (Meas.S.)), Bachelor of Science (Mechanical Engineering) (B.S. (M.E.)), Master of Science (M.S.), Master of Engineering Administration (M.E.A.), and Doctor of Science (D.Sc.)

SCHOOL OF EDUCATION: Bachelor of Arts in Education (B.A. in Ed.), Bachelor of Science in Physical Education (B.S. in P.E.), Master of Arts in Teaching (M.A.T.), Master of Arts in Education (M.A. in Ed.), Education Specialist (Ed.S.), and Doctor of Education (Ed.D.)

SCHOOL OF GOVERNMENT AND BUSINESS ADMINISTRATION: Bachelor of Business Administration (B.B.A.), Bachelor of Science in General Studies (B.S. in Gen.Std.), Master of Arts in Government (M.A. in Govt.), Master of Arts in Health Care Administration (M.A. in H.C.A.), Master of Business Administration (M.B.A.), Master of Public Administration (M.P.A.), Master of Science in Administration (M.S. in Adm.), Master of Science in Business Administration (M.S. in B.A.), Master of Urban and Regional Planning (M. of Urb. and Reg.Plan.), Graduate Certificate in Health Care Administration (Grad.Cert. in H.C.A.), Doctor of Business Administration (D.B.A.), and Doctor of Public Administration (D.P.A.)

SCHOOL OF PUBLIC AND INTERNATIONAL AFFAIRS: Bachelor of Arts (B.A.), Certificate of the Institute for Sino-Soviet Studies (Cert. of I.S.S.S.), Master of Arts (M.A.), and Master of Science in International Affairs (M.S. in I.A.)

THE GEORGE WASHINGTON UNIVERSITY

COLUMBIAN COLLEGE OF ARTS AND SCIENCES, 1821

THE GRADUATE SCHOOL OF ARTS AND SCIENCES, 1893

THE SCHOOL OF MEDICINE, 1825

THE NATIONAL LAW CENTER, 1865

THE SCHOOL OF ENGINEERING AND APPLIED SCIENCE, 1884

THE SCHOOL OF EDUCATION, 1907

THE SCHOOL OF GOVERNMENT AND BUSINESS ADMINISTRATION, 1928

THE SCHOOL OF PUBLIC AND INTERNATIONAL AFFAIRS, 1928

THE COLLEGE OF GENERAL STUDIES, 1950

THE DIVISION OF UNIVERSITY STUDENTS, 1930

THE SUMMER SESSIONS, 1916

THE UNIVERSITY HOSPITAL, 1898

THE GEORGE WASHINGTON UNIVERSITY BULLETIN

THE
UNIVERSITY
RECORD

and

1969-1970

DEGREES CONFERRED

September 30, 1969

COLUMBIAN COLLEGE OF ARTS AND SCIENCES

SCHOOL OF ARTS

THE UNIVERSITY RECORD

1969-1970

James Earl Acry, Jr., Virginia	Louise Brackner, Virginia
Arabic Language and Literature	Economics (With Distinction)
John Jess Alcott, New York	Ellen Brooks, Maryland
Psychology	Anthropology
John Ames, District of Columbia	William Buchanan, District of Columbia
Sociology	History
Barley Elmhurst Anna, Virginia	John Robert Balford, Maryland
Psychology	Economics
John Elmhurst, District of Columbia	John S. New South, Virginia
Arabic	Ecology Literature
Sociology	God Frederick Davis, Virginia
John Elmhurst, Massachusetts	Art History and Theory
English Literature	John Vivian Howell, Wisconsin
John Elmhurst, Maryland	Economics
Psychology (Special Needs)	Charles Ransom Carpenter, District of Columbia
John Elmhurst, Pennsylvania	Ecology
Political Science	John Elmhurst, District of Columbia
John Elmhurst, Virginia	Anthropology
Social Sciences	John Elmhurst, District of Columbia
John Elmhurst, Virginia	Anthropology
Sociology	John Elmhurst, District of Columbia
John Elmhurst, Maryland	Ecology (With Distinction)
Sociology	John Elmhurst, District of Columbia
John Elmhurst, New York	Ecology
Ecology Literature	John Elmhurst, District of Columbia
John Elmhurst, New Jersey	Ecology Literature
Ecology	John Elmhurst, District of Columbia
John Elmhurst, Connecticut	Ecology
Sociology	John Elmhurst, District of Columbia
John Elmhurst, Maryland	Ecology
John Elmhurst, New York	Ecology
Art History and Theory	Donald Buchanan, District of Columbia
John Elmhurst, Virginia	Economics
History	

THE
UNIVERSITY
RECORD
1853-1870

DEGREES CONFERRED

September 30, 1969

COLUMBIAN COLLEGE OF ARTS AND SCIENCES

BACHELOR OF ARTS

Thomas Earl Acey, Jr., Virginia	Carol Louise Breckner, Virginia
Russian Language and Literature	Economics (With Distinction)
Marilyn Jean Alessi, New York	Judith Ellen Brodsky, Maryland
Psychology	Anthropology
Susan Jane Ames, District of Columbia	William Buchanan, District of Columbia
Sociology	History
Susan Bailey Einbinder Anna, Virginia	John Robert Bullock, Maryland
Psychology	Economics
Lynne Kittredge Atherton, District of Columbia	Jeanne Schou Burch, Virginia
Sociology	English Literature
Nancy Christina Baer, Massachusetts	Gail Freeman Burke, Virginia
English Literature	Art History and Theory
Stephen Clare Barker, Maryland	Brian Vivial Buzzell, Wisconsin
Psychology (Special Honors)	Economics
Myra Baylin, Pennsylvania	Carlos Ramón Carpintero Días,
Political Science	Puerto Rico
Samuel Harrison Beissel, Virginia	Anthropology
Social Sciences	Victoria Jurika Cecil, District of Columbia
Dwight Allen Bellinger, Virginia	Anthropology
Zoology	Jeanne Gardiner Chaney, Maryland
Charles Benton III, Maryland	Sociology (With Distinction)
Sociology	Ellen Louise Chesney, District of Columbia
Ellen Bernstein, New York	History
English Literature	Sheila King Clarke, Connecticut
Christopher Bertrand, New Jersey	English Literature
History	Mary Elizabeth Colen, District of Columbia
Donald Haskell Beskind, Connecticut	History
Sociology	Maureen Isabelle Cunningham, Maryland
Catherine Ann Billingsley, Maryland	History
Fine Arts	Donald Benjamin Dailey, Jr., Georgia
Marilyn Carrie Bootsma, New York	Economics
Art History and Theory	
John Carter Bradley, Virginia	
History	

- Christina Zaremba Del Russo, District of Columbia
English Literature (Special Honors)
- Dennis Patrick Derrick, District of Columbia
Political Science
- Suzanne Rose Dochez, Maryland
Fine Arts
- Joan Frederick Drake, Colorado
Spanish Language and Literature
- Barbara Peo Early, District of Columbia
Political Science
- Mary Angela Ebzery, Illinois
Psychology
- Evelyn Elkin, Virginia
Psychology
- Ann Barthelmes Finkelstein, District of Columbia
Sociology
- Gordon Christian Folkemer, Pennsylvania
History
- Glenn Lynn Forest, Virginia
Philosophy
- James Andrew Fox, Maryland
Psychology
- Lois Frischling, New Jersey
Art History and Theory
- David Cornfield Ganz, District of Columbia
Economics
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Political Science
- James Alexander Goodhill, New Jersey
Philosophy (With Distinction)
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Anthropology
- Allen Gottlieb, District of Columbia
Sociology
- Robert Saul Greenberg, New Jersey
Political Science
- Steven Nick Greer, District of Columbia
Sociology
- Margaret Ellen Heinlein, New York
Psychology
- Paula Janet Hendrickson, District of Columbia
Sociology
- Barbara Ann Hirsh, Florida
Psychology
- Diane Elizabeth Hodgman, Massachusetts
Anthropology
- John Henry Hoskinson II, District of Columbia
Economics
- Marvin Lee Ickow, Illinois
Sociology
- John Michael Immerman, New Jersey
Psychology
- Arlene Sharon Jaffe, New Jersey
History
- Leslie Gail Jeweler, Maryland
Speech Pathology and Audiology
- Diane Johnson, New York
Psychology
- Earl Michael Kabnick, New York
Psychology
- Doris Ann Kaufman, Kentucky
Economics
- Christopher Rogers Kloman, Virginia
History
- Renata Slavin Kossow, District of Columbia
Psychology
- Laura Anne Kruger, New Jersey
Sociology
- John Marc Lackey, Virginia
History
- John Walter Le Mon, New York
Psychology
- David Robert Levin, District of Columbia
American Thought and Civilization
- Elizabeth Richards Lewis, District of Columbia
Psychology
- Sherry Willis Lewis, District of Columbia
Zoology
- Phillip Lubitz, New Jersey
Anthropology
- James Vincent Lyons, New York
Geography
- Alexis Ann Mack, Illinois
Psychology
- Liddell Louise Madden, District of Columbia
Sociology
- Julia Newell Marshall, Minnesota
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- Audrea Bono Mitchell, Virginia
Fine Arts
- Alexa Michele Moleski, Pennsylvania
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- Robert Parker Moltz, Maryland
History
- Ann Esther Larson Murray, Vermont
Psychology
- Barbara Laraine Nedbor, New York
Art History and Theory
- Peggy Whitaker Neel, Maryland
Sociology (With Distinction)
- Nanette Neely, New York
Economics
- Peter Robert Nelsen, Maryland
Fine Arts

- Tommy Anthony Noonan, District of
Columbia
History
- Maureen Ellen O'Gara, New York
History
- Karen Kingery Parkins, District of
Columbia
History
- Carmin James Patti, New York
History
- Donald Taliaferro Pole, New Jersey
Sociology
- Rosamond Prout, Massachusetts
American Thought and Civilization
- Mary Hayden Ranta, Maryland
Art History and Theory
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Economics
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Political Science
- David Woolever Rogers, Virginia
Political Science
- Barbara Putnam Rubin, Maryland
Speech Pathology and Audiology
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Sociology
- Cengiz Sagcan, Turkey
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- Frances Lafferty Saran, Virginia
American Thought and Civilization
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Sociology
- Paula Miriam Segal, Connecticut
Political Science
- Margret Ezzell Seibert, District of
Columbia
Dramatic Art
- Sheila Kay Shea, Virginia
Psychology
- John Albert Shimer, Connecticut
Psychology
- Jay Elliott Silberman, Virginia
American Thought and Civilization
- Mary Theresa Smith, California
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- Patricia Jean Smith, Connecticut
Political Science
- Maria Aschenbach Spottswood, District
of Columbia
Mathematics
- Stephen Lystad Sprehn, Maryland
Mathematics
- Ellyn Bari Stadler, Virginia
Psychology
- Reynold Edward Staffel, Jr., Illinois
Sociology
- Susanne Dorothy Thevenet, New Jersey
Political Science
- Linda Lee Tjossem, District of Columbia
Art History and Theory
- Charity Lambert Vanderbilt, New York
History
- James Edward Van Zandt, Virginia
Geography
- Frances Jean Walther, Virginia
Psychology
- Alan Pendleton Wilson, Virginia
Political Science
- Louisa Merryman Ridgely Young,
Maryland
American Thought and Civilization
- Sandra Schinnerer Younger, Maryland
Political Science
- Eileen Margo Zola, District of Columbia
Art History and Theory

BACHELOR OF SCIENCE

- Marilyn Arnold, Idaho
Zoology
- Wendell Owen Wolff, District of
Columbia
Chemistry

BACHELOR OF SCIENCE IN GENERAL STUDIES

- Buren Levi Blackwelder, Virginia
Political Science
- Donald Lee McGraw, Virginia
Political Science
- John Leighton Merrick, Virginia
Political Science
- Stuart Allen Tiegel, District of
Columbia
Psychology

BACHELOR OF SCIENCE IN GEODETIC AND CARTOGRAPHIC SCIENCE

David Landen, Virginia
Cartography

BACHELOR OF SCIENCE IN MEDICAL TECHNOLOGY

Nancy Karen Beck, Maryland
Bonita Marie Bundy, District of
Columbia
(With Distinction)
Katherine Ann Donovan, New Jersey
Helena Marie Glidden, Virginia
Carol Ann Kendrick, Maryland
(With Distinction)

Susan Mary Kyle, District of Columbia
Lynda Carol Kelley Michelson, Maryland
Virginia Joanne Profta, District of
Columbia
Linda Rae Shapiro, Virginia
Susan Hope Ullrich, New Jersey
Barbara Lee Yalisove, Delaware

GRADUATE SCHOOL OF ARTS AND SCIENCES

MASTER OF ARTS

Aydele Akinnusi, Nigeria
Mathematical Statistics
B.S. 1966, University of Ife, Nigeria
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History
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Political Science
B.A. 1965, Newcomb College, Tulane
University of Louisiana
Maureen Lee Craig, Maryland
Speech Pathology and Audiology
B.A. 1968, George Washington
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Ruan Sumner Davies, Maryland
Art History and Criticism
B.A. 1964, Hood College
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French Language and Literature
B.A. 1966, George Washington
University
Margaret Mary Fleming, District of
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Anthropology
B.A. 1959, Dominican College of
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Psychology
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B.A. 1963, West Virginia University
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B.S. 1966, University of Oklahoma
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B.A. 1965, University of Scranton
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B.S. 1965, University of Maryland
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Massachusetts
History
B.A. 1964, Boston University
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B.S. 1967, Brigham Young University
Ronald David Schmal, District of
Columbia
Psychology
B.A. 1966, Cornell University
Glenn Butler Short, Virginia
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B.A. 1967, George Washington
University
Joseph MacGeorge Snyder,
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English and American Literature
B.A. 1964, Boston University

Kathryn Marie Truex, District of
Columbia
Political Science
B.A. 1966, Stanford University
Joanne Elaine Tumolo, Virginia
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B.A. 1968, George Washington
University
Kathleen Verduin, Illinois
English and American Literature
B.A. 1966, Hope College
Kathleen Zollman Williams, District of
Columbia
History
B.A. 1965, George Washington
University

Linnis Cook Woodruff, Pennsylvania
English Literature
B.A. 1965, George Washington
University
Albert Leonard Yarashus, District of
Columbia
English Literature
B.S. 1956, St. Francis College, Pa.
LL.B. 1959, Villanova University

MASTER OF FINE ARTS

Teresa Bennett Fulton, Virginia
Painting
B.A. 1928, University of Oklahoma
Fuller Griffith, District of Columbia
Graphics
B.S. 1952, University of Wisconsin
Gary Richard Irby, District of Columbia
Painting
B.S. in Ed. 1965, Eastern Illinois
University

Adelaide Marguerite Haas Knapp,
Virginia
Graphics
B.A. 1954, Randolph-Macon Woman's
College
Margaret Mary McGuigan, District of
Columbia
Dramatic Art
B.A. 1965, Jersey City State College
Margaret Cook Price, Virginia
Painting
B.S. 1962, Wheelock College

MASTER OF SCIENCE

Harry Matusiak Alwine, Maryland
Microbiology
B.S. 1963, Ursinus College
Charles Ronald Brewington, Maryland
Chemistry
B.S. 1965, University of Maryland
Jeanne Anne Carriere, Maryland
Zoology
B.S. 1967, George Washington
University
Nicholas Lampiris, District of Columbia
Geology
B.A. 1964, George Washington
University

Carol Lee Muth, Virginia
Anatomy
B.A. 1966, Columbia Union College
Stephen Minick Neely, District of
Columbia
Zoology
B.S. 1967, George Washington
University
Vaidyanatha Subramaniaswamy, District
of Columbia
Applied Statistics
M.S. 1954, Kerala University, India
Jesse David Wall, District of Columbia
Physics
B.S. 1962, Wichita State University

MASTER OF PHILOSOPHY

James Michael Buckley, District of
Columbia
History
B.S. 1959, M.A. 1961, Georgetown
University

James Lester Kirkman, Virginia
Political Science
B.A. 1961, M.A. 1963, American
University

James Alfred Lee, Maryland
Human Ecology
B.S. 1949, Union College
M.S. 1951, Cornell University
Garnett Lloyd Mack, Virginia
American Literature
B.A. 1954, Storer College
M.A. 1966, George Washington University
Suzanne Fenske Parrett, California
Psychology
B.A. 1963, M.A. 1964, Ohio State University
Alex Rode, District of Columbia
Psychology
B.A. in Govt. 1958, George Washington University

Raymond Augustine Schroth, New York
American Civilization
B.A. 1955, M.A. 1962, Fordham University
B.A. in Theol. 1966, Woodstock College
Ch'ao-sheng Sung, Maryland
Political Science
B.A. 1959, Tunghai University, Taiwan
M.A. 1963, University of Wisconsin
Charles Wesley Swisher, South Carolina
Psychology
B.A. 1962, M.S. 1963, George Washington University

DOCTOR OF PHILOSOPHY

James Ivan Ausman, Minnesota
Pharmacology
Dissertation: *The Chemotherapy of Brain Tumors: Pharmacology and Therapeutics*
B.S. 1959, Tufts University
M.D. 1963, Johns Hopkins University
M.A. 1964, State University of New York at Buffalo
Routh Nash Coffman, Virginia
Psychology
Dissertation: *Role-taking Defects as Correlates of Criminality and Mental Illness in Offender Populations*
B.A. 1961, M.A. 1967, George Washington University
Nancy Marie Foster, Texas
Zoology
Dissertation: *On the Spionidae (Polychaeta) of the Gulf of Mexico and Caribbean Sea*
B.S. 1963, Texas Woman's University
M.S. 1965, Texas Christian University
Carolyn Myrick Hardin, District of Columbia
Physiology
Dissertation: *Some Neurochemical and Fluorescence Histochemical Correlates of the Action of Testosterone on Developing Rat Brain*
B.A. 1958, M.A. 1959, George Washington University
Robert Cameron Herold, Washington
Political Science
Dissertation: *The Politics of Decision-making in the Defense Establishment: A Case Study*
B.S. 1961, Brigham Young University
M.A. 1964, George Washington University
Ruth Doris Koidan, Maryland
Mathematics
Dissertation: *Convergence Bases and Sub-bases in General Topology*
B.A. 1954, B.S. 1958, M.A. 1962, George Washington University

- Marlyn Waggener Korin, District of Columbia
Germanic Languages and Literatures
Dissertation: *An Analysis of Skaldic Poetry*
B.A. 1955, Stanford University
M.A. 1962, George Washington University
- David Herbert Otis Lawson, Virginia
Psychology
Dissertation: *An Investigation of the Interrelationship of Personality, Relevance, and Conformity as Related to Self-assessment in Small Group Functioning*
B.A. 1958, Dartmouth College
M.A. 1962, George Washington University
- Harold Emory Marshall, Virginia
Economics
Dissertation: *The Relationships between Local Cost-sharing and Efficient Water-resource Development*
B.A. 1964, M.A. 1966, George Washington University
- Julian Mitchell Menter, New York
Chemistry
Dissertation: *Photochemical Study of Intramolecular Energy Transfer between Nonconjugated Chromophores*
B.A. 1964, Alfred University
M.S. 1966, George Washington University
- William James Scott, Jr., Virginia
Anatomy
Dissertation: *A Study of the Locus of Teratogenic Action of Acetazolamide in the Rat*
D.V.M. 1961, University of Georgia
- Robert Edward Sobel, Florida
Biochemistry
Dissertation: *The Partial Purification and Properties of Three Brain Peptidases*
B.A. 1962, Columbia University
M.S. 1966, George Washington University
- Janusz Bogdan Suszkiw, District of Columbia
Biochemistry
Dissertation: *Mammalian Brain Arylamidase Studies of Catalytic and Functional Properties*
B.S. 1966, M.S. 1968, George Washington University
- John Reed Thomas, Maryland
International Relations
Dissertation: *Soviet Policy toward Communist China and the 1958 Taiwan Straits Crisis*
B.A. 1952, M.A. 1953, Columbia University
- Jesus Eduardo Vaz, Virginia
Geochemistry
Dissertation: *Metamictization—Thermoluminescence Relations in Zircon*
B.S. 1963, M.S. 1965, University of Kansas
- James Howard Wise, Maryland
Psychology
Dissertation: *Cognitive Dissonance and Reinforcement-incentive Theory Predictions on the Role of Reward in Influencing Attitude Formation and Performance*
B.A. 1963, Adelphi University
M.A. 1965, George Washington University

Natalie Greenough Zuckerman, Massachusetts

Physiology

Dissertation: *Estrogen Formation and Hydrolysis in Rat Tissues with Particular Reference to Estrogen-3-Sulfate Hydrolysis by Rat Kidney Microsomes*

B.A. 1956, Radcliffe College

NATIONAL LAW CENTER

JURIS DOCTOR

- | | |
|--|---|
| Richard Lee Ballantyne, District of Columbia
(With Honors)
B.S.E. 1965, M.B.A. 1967, University of Connecticut | Howard Ruggles Green II, Hawaii
(With Honors)
B.A. 1964, University of California, Berkeley |
| John Moore Blish, Virginia
B.A. 1966, George Washington University | Richard Joseph Ham, Maryland
B.A. 1966, George Washington University |
| William Joseph Bonner, Virginia
B.A. 1961, Phillips University | Alan Raymond Harter, Virginia
(With Honors)
B.S. 1958, Utah State University of Agriculture and Applied Science |
| Jeffrey Knight Brinck, District of Columbia
(With Honors)
B.A. 1962, Dartmouth College
M.S. 1964, Stanford University | Carol Theresa Hawkins, Hawaii
B.A. 1966, Skidmore College |
| David Springer Brown, Jr., Virginia
B.A. 1966, Syracuse University | Gilbert Hall Hennessey III, District of Columbia
(With Honors)
B.A. 1966, Beloit College |
| Arnold David Bruckner, Maryland
B.B.A. 1964, George Washington University | Albert Anthony Kashinski, Virginia
B.A. 1963, B.S. 1964, University of Notre Dame |
| Martha Edyth Bryan, Virginia
(With Honors)
B.A. 1966, Brenau College | Charles Melvin Leedom, Jr., District of Columbia
(With Honors)
B.S. 1966, Purdue University |
| James Craig Carman, Virginia
B.S. 1966, University of Utah | Samuel Michael Levin, Virginia
B.A. 1966, George Washington University |
| George Edwin Christopher, Maryland
B.S. 1952, University of Maryland | Lawrence Alexander Morrison, Virginia
B.A. 1960, George Washington University |
| Daniel John Clement, Pennsylvania
(With Honors)
B.S. 1966, Pennsylvania State University | Raymond Pardo Niro, Virginia
(With Honors)
B.S. 1964, University of Pittsburgh |
| William Edwin Crews, Ohio
(With Honors)
B.A. 1966, Miami University | George Pappas, Illinois
B.S. 1966, Carroll College, Wis. |
| Philip Douglas Dickinson, Maryland
B.A. 1966, Franklin and Marshall College | Joseph Raymond Roberts, Pennsylvania
B.A. 1962, Pennsylvania State University |
| Heather Strachan Foley, District of Columbia
B.A. 1961, Pembroke College | M.A. 1967, George Washington University |
| Edward Ronald Freedman, Tennessee
B.S.E. (Ch.E.), B.S.E. (Met.E.) 1966, University of Michigan | Alton Douglas Rollins, Virginia
(With Highest Honors)
B.S. 1961, American University |
| Mark David Graubard, New York
B.A. 1966, State University of New York at Binghamton | John Hollister Stein, District of Columbia
B.A. 1964, Yale University |

Alan James Stone, Illinois
 B.A. 1966, Miami University
 Samuel J. Sutton, Virginia
 (With Honors)
 B.A. 1964, B.S. in E.E. 1967,
 University of Arizona
 Donald William Thomas, Virginia
 (With Honors)
 B.S. in E.E. 1953, University of Iowa
 Thomas Norton Tureen, Maine
 B.A. 1966, Princeton University

Tonita Minge Warren, District of
 Columbia
 B.A. 1966, Westhampton College
 Electra Catsonis Wheatley, Maryland
 (With Honors)
 B.A. 1955, Pennsylvania State
 University
 Glenn Allen White, Virginia
 (With Honors)
 B.A. 1966, DePauw University
 John Small Winder, Jr., District of
 Columbia
 B.A. 1966, University of Michigan

MASTER OF LAWS

Joseph Laurie Battle, Alabama
 Labor Law
 LL.B. 1967, University of Alabama
 Robert Christopher Boasberg, Jr., New
 York
 Public International and
 Comparative Law
 B.S. in B.A. 1962, Georgetown
 University
 LL.B. 1965, State University of New
 York at Buffalo
 William Abraham Crane, Ohio
 Public International and
 Comparative Law
 B.A., J.D. 1960, Ohio State University
 James Gordon Gidding, Maryland
 Taxation
 B.S. in F.S. 1943, Georgetown
 University
 M.A. 1948, Ohio State University
 LL.B. 1950, University of Virginia
 David Rogers Hendrick, Jr., Texas
 B.A. 1965, LL.B. 1967, Baylor
 University
 Charles Frederick Hite, Pennsylvania
 B.S. 1960, Pennsylvania State
 University
 LL.B. 1963, Georgetown University
 William Kegel Hogan, Wyoming
 Taxation
 B.A. 1962, Georgetown University
 J.D. 1965, Hastings College of the Law
 Stuart Everett Kaufman, New York
 B.A. 1965, New York University
 J.D. 1968, George Washington
 University
 Edward Glen Ketchen, Jr., Maryland
 B.S. in I.E. 1963, J.D. 1968, University
 of Tennessee

Jerome Neil Kline, Maryland
 B.S. 1965, Pennsylvania State
 University
 J.D. 1968, Villanova University
 Walter William Krieger, Jr., Kentucky
 Public International and
 Comparative Law (With Highest
 Honors)
 B.A. 1959, Bellarmine-Ursuline College
 LL.B. 1962, University of Louisville
 Raymond Everett Lisle, District of
 Columbia
 (With Highest Honors)
 B.S. in S.S. 1929, City College, New
 York
 M.A. 1930, Columbia University
 J.D. 1936, New York University
 Richard Lee Marlar, Virginia
 Taxation
 B.S. 1956, University of Oklahoma
 J.D. 1963, American University
 Henry John McGurren, District of
 Columbia
 B.A. 1965, J.D. 1968, University of
 Arizona
 Michael Maulsby Moore, Virginia
 Public International and
 Comparative Law
 B.A. 1961, LL.B. 1964, University
 of Washington
 Thien Koan Ng, California
 Taxation
 B.B.A. 1965, M.B.A. 1967, J.D. 1968,
 Golden Gate College
 John Kenneth Pruellage, Virginia
 Taxation
 B.S. in Com. 1962, St. Louis University
 J.D. 1965, University of Missouri

Clifford Lee Reeves, District of Columbia
Public International and
Comparative Law

B.A. 1966, J.D. 1968, University of
Alabama

John Norick Schaefer, Maryland

B.B.A. 1963, University of Oklahoma

LL.B. 1966, University of Texas at
Austin

Howard Roger Warwick, Jr., Texas

Public International and
Comparative Law

B.S. 1960, University of Houston

LL.B. 1962, Southern Methodist
University

Paul Alexander Wille, District of
Columbia

B.A. 1956, Lake Forest College

J.D. 1959, University of Chicago

Douglas Jerome Wold, Montana

Taxation

B.S. 1963, LL.B. 1965, University of
Montana

Raymond Lester Wolitz, Virginia

(With Highest Honors)

B.A. 1965, Queens College, N.Y.

J.D. 1968, New York University

DOCTOR OF JURIDICAL SCIENCE

John Hayes Reese, Colorado

Administrative Law

Dissertation: *Power-Policy People: A Study of Driver Licensing Administration*

B.B.A., LL.B. 1954, Southern Methodist University

LL.M. 1965, George Washington University

SCHOOL OF ENGINEERING AND APPLIED SCIENCE

BACHELOR OF SCIENCE (Civil Engineering)

Turki Raghib Elbashir, Virginia

Nazih Michel Hayek, Lebanon

Sandy Joel Marenberg, Maryland

Gerald Francis Wilber, Virginia

BACHELOR OF SCIENCE (Electrical Engineering)

Frank Allan Asnes, New York

Kong-Yin Ho, Hong Kong

Myron A. Schloss, Maryland

Wesley Allan Winchell, Maryland

Dennis Arling Woolaver, Maryland

BACHELOR OF SCIENCE (Mechanical Engineering)

Gurminder Singh Bedi, District of Columbia

MASTER OF ENGINEERING ADMINISTRATION

Charles Albert Baker, Maryland

B.S. 1947, Loyola College

M.S. 1948, Ph.D. 1953, Georgetown
University

Louis B. Brown, District of Columbia

B.S. 1959, Bates College

Hector Enrique Castro, District of
Columbia

B.M.E. 1967, Catholic University of
America

Joseph Robert Crupi, Maryland

B.S. in E.E. 1966, University of
Maryland

Vincent Albert Ferry, Virginia

B.E. 1961, Youngstown University

Chue George Ing, Virginia

B.S. 1962, St. Mary's University,
Halifax, Nova Scotia

Rowland Sander Johnson, Virginia

B.E.E. 1961, University of Virginia

James Robert Nowland, Maryland

B.Ae.E. 1958, University of Virginia

John Harold Plummer, District of
Columbia

B.S. in C.E. 1966, University of
Maryland

MASTER OF SCIENCE

- Michael Clifford Burstein, District of Columbia
Operations Research
B.A. 1964, Johns Hopkins University
- Jawahar L. Chaudhary, Maryland
Thermal Sciences
B.S. in M.E. 1967, Howard University
- Rudolph Montgomery Decatur, Jr., Virginia
Electrical Engineering
B.E.E. 1965, George Washington University
- John Thomas Hall, Virginia
Electronics
B.S. (Electronics) 1964, George Washington University
- Ray Kenneth Heist III, Maryland
Electrical Engineering
B.S. in E.E. 1964, Lehigh University
- Maris Juberts, Maryland
Electrical Engineering
B.S. in E.E. 1963, State University of New York at Buffalo
- Oscar Milton Kramer, Maryland
Electrical Engineering
B.E.E. 1963, George Washington University
- Rollo James Krueger, Maryland
Electrical Engineering
B.S. in M.E. 1956, Michigan Technological University
- B.S. in E.E. 1963, Marquette University
- William Allen Lemeschewsky, Virginia
Networks
B.S. (E.E.) 1968, George Washington University
- Paul Eugene Milbrodt, Virginia
Electrical Engineering
B.S. in E.E. 1951, University of Arkansas
- James David Pavlis, Maryland
Networks
B.S. (E.E.) 1967, George Washington University
- John Henry Romer, Maryland
Electrical Engineering
B.S. in Engr. 1961, State University of New York at Buffalo
- Donald Otto Schultz, Virginia
Electrical Engineering
B.E.E. 1960, George Washington University
- Stanley Steinberg, Virginia
Electrical Engineering
B.S. in E.E. 1964, Wayne State University
- Beverly Eugene Taylor, Virginia
Electrical Engineering
B.E.E. 1955, North Carolina State University at Raleigh
- John Manning Wehrung, Maryland
Electrical Engineering
B.E.E. 1965, George Washington University

DOCTOR OF SCIENCE

- Dudley Wilfred Gill, Jr., Maryland
Computer Science
Dissertation: *On the Theory, Design, and Utilization of a Multi-machine Computing System*
B.S. in E.E. 1956, Howard University
M.S. in E.E. 1961, University of Pennsylvania
- Richard Moore, Minnesota
Medical Engineering
Dissertation: *A Model Describing Water Transport from a Living Cell During Cooling*
B.S. in E.E. 1949, University of Missouri
Ph.D. 1956, University of Rochester
- Victor Selman, Virginia
Systems Reliability
Dissertation: *A Mathematical Model for the Determination of System Burn-in Times in Complex Electronic Equipment*
B.A. 1956, New York University
M.S. 1960, Stevens Institute of Technology

SCHOOL OF EDUCATION

BACHELOR OF ARTS IN EDUCATION

- | | |
|---|---|
| Mary Elizabeth Alpaugh, South Carolina
General Science | Elinor Wilson Ingram, District of
Columbia
Elementary Education |
| Jessica Susan Bornstein, District of
Columbia
Elementary Education | Mary Hope Michael Katsouros, District
of Columbia
French |
| Alta Maurine Brenner, District of
Columbia
Elementary Education
(With Distinction) | Sarah Bottorff Martin, Virginia
Elementary Education |
| Janet Lee Brushwood, District of
Columbia
Elementary Education | Marsha Phyllis Rosenthal, New Jersey
English |
| Carole Beth Golden, New Jersey
English | Martha Ann Teich Schwartz, Maryland
Elementary Education |
| Linda Lee Hughes, Maryland
English | Beverly Ruth Smith, Maryland
Elementary Education |
| | Gertrude Tulley Surut, District of
Columbia
Spanish |

MASTER OF ARTS IN EDUCATION

- | | |
|--|--|
| Eleanor Sidney Abrams, Pennsylvania
Secondary Education
B.S. 1968, University of Wisconsin | Judith Kempler Broida, Maryland
Student Personnel Work in
Higher Education
B.A. 1968, George Washington
University |
| Florence Latimer Avis, Maryland
Guidance
B.S. 1961, Florida State University | James Baird Buck, Virginia
Secondary Education
B.S. 1935, U.S. Military Academy |
| John Bernard Balch, Virginia
Secondary Education
B.S. 1939, U.S. Naval Academy | Mae Dixon Bunn, District of Columbia
Elementary Administration
B.S. 1952, District of Columbia
Teachers College |
| M.M.E. 1948, Rensselaer Polytechnic
Institute | Ella Madden Burgess, District of
Columbia
Guidance
B.S. 1960, District of Columbia
Teachers College |
| Margaret Davis Barry, Virginia
Guidance
B.A. 1965, University of Maryland | Theresa McIntosh Burgess, District of
Columbia
Human Growth and Development
B.S. 1960, District of Columbia
Teachers College |
| Richard Mark Adolph Baush, Virginia
Secondary Administration
B.S. in Ed. 1958, Millersville State
College | Dorothy Carstensen Caine, California
Guidance
B.A. 1963, Wartburg College |
| William Earnshaw Blandford, Maryland
Secondary Education
B.S. in Ed. 1961, Mount St. Mary's
College, Md. | Thelma Karen Carter, Virginia
Guidance
B.A. 1961, Virginia State College |
| Maureen Ann Boesen, Virginia
Special Education
B.A. 1965, St. Joseph College, Conn. | |
| Edward Lee Bradshaw, Virginia
Physical Education
B.S. in P.E. 1968, George Washington
University | |

- Margaret Baker Cochran, Maryland
Guidance
B.A. in Ed. 1961, George Washington University
- Joyce Tenneson Cohen, District of Columbia
Secondary Education
B.A. 1967, Regis College, Mass.
- Richard George Colby, Jr., District of Columbia
Special Education
B.A. 1965, American University
- Gerald William Commerford, New York
Student Personnel Work in Higher Education
B.A. 1968, Colgate University
- Donald Purnell Conway, Maryland
Physical Education
B.S. 1964, Delaware State College
- James Ramsey Cowan, Maryland
Guidance
B.A. 1964, Salisbury State College
- William Hazlett Craig, South Carolina
Secondary Education
B.A. 1950, Syracuse University
- Jack Edward Crigger, Maryland
Guidance
B.S. 1961, Bluefield State College
- Joyce Annette Dandridge, District of Columbia
Elementary Education
B.S. 1966, Morgan State College
- Marilyn Baker Davis, Virginia
Guidance
B.S. in Elem.Ed. 1953, University of Texas at Austin
- Walter Navarro Davis, District of Columbia
Reading
B.A. 1956, North Carolina College at Durham
- Hugh Max Derr, Jr., Virginia
Secondary Administration
B.A. 1965, Shepherd College
- Natalie Ann DiTrani, Maryland
Reading
B.S. in Ed. 1955, Notre Dame College of Staten Island
- Arthur John Dock, Maryland
Elementary Administration
B.S. in Elem.Ed. 1954, Bowie State College
- Burnette Miller Doles, Virginia
Guidance
B.S. 1962, Old Dominion College
- Kaye Elizabeth Gant Douglass, District of Columbia
Guidance
B.A. in Elem.Ed. 1965, Howard University
- George Howard DuBose, Jr., Virginia
Special Education
B.A. 1958, St. Augustine's College
- Rubye Kaye Duckwilder, District of Columbia
Secondary Education
B.S. 1947, North Carolina College at Durham
- Jeremy Livingston Durfee, California
Rehabilitation Counseling
B.A. 1967, University of California, Santa Barbara
- Frances DeLeo Dusterhoff, Maryland
Elementary Administration
B.A. in Ed. 1965, George Washington University
- Paula Clare Duzmati, Connecticut
Student Personnel Work in Higher Education
B.A. 1968, St. Joseph College, Conn.
- Rosemary English, District of Columbia
Guidance
B.A. 1968, George Washington University
- Nancy Reiff Fitzgerald, Virginia
Guidance
B.A. 1966, Muhlenberg College
- Austine Brown Fowler, Maryland
Early Childhood Education
B.S. 1960, District of Columbia Teachers College
- Roberta Rae Frank, Pennsylvania
Student Personnel Work in Higher Education
B.S. in Ed. 1968, Temple University
- Jan Richmond Frey, Maryland
Secondary Administration
B.A. 1962, George Peabody College for Teachers
- Susan Meyers Friedman, New York
Reading
B.A. 1964, Brooklyn College
- Dorothy Dunsen Gholson, Maryland
Elementary Administration
B.S. 1962, Bowie State College
- Jeanne Hanson Goodhue, Maryland
Rehabilitation Counseling
B.A. 1939, University of Rochester
- Carolyn Miller Grasmehr, Virginia
Elementary Administration
B.A. 1945, Connecticut College

- Paul Roy Greenberg, District of Columbia
Student Personnel Work in Higher Education
B.A. 1968, George Washington University
Annmerle Greenstein, New Jersey
Guidance
B.A. 1964, American University
Marjorie Ulmer Haigler, District of Columbia
Elementary Administration
B.S. in Ed. 1951, Winston-Salem State College
Brenda Hines Hammond, District of Columbia
Elementary Education
B.A. 1965, Fisk University
Osceola Hansberry Hankins, District of Columbia
Guidance
B.A. 1947, Southern University and Agricultural and Mechanical College
Helen Rebecca Hedin, Maryland
Elementary Education
B.S. 1962, College of William and Mary
Margaret Smith Herby, Virginia
Rehabilitation Counseling
B.S. 1948, Columbia University
Edna Myers Hill, District of Columbia
Secondary Education
B.S. 1957, Morgan State College
Timothy Wellington Hill, Virginia
Physical Education
B.S. in P.E. 1966, George Washington University
Mary Buford Hitz, Virginia
Secondary Education
B.A. 1963, Smith College
Jade Adele Hobson, California
Student Personnel Work in Higher Education
B.A. 1968, Whittier College, Calif.
Helen Scott Huggins, Virginia
Guidance
B.S. in P.E. 1947, University of North Carolina at Greensboro
Vivian Washington Johnson, District of Columbia
Elementary Administration
B.S. 1965, District of Columbia Teachers College
Joseph Ewell Johnston, Virginia
Student Personnel Work in Higher Education
B.A. 1966, University of Maryland
Leonard Karp, Virginia
Physical Education
B.S. 1962, Queens College, N.Y.
Joan Stevens Kelly, District of Columbia
Elementary Administration
B.S. 1964, District of Columbia Teachers College
Thomas Julian Kelly, District of Columbia
Elementary Administration
B.S. 1959, District of Columbia Teachers College
James Patrick Kenney, Jr., District of Columbia
Rehabilitation Counseling
B.S. 1967, Frostburg State College
Isobel Fanny Klein, New York
Secondary Education
B.A. 1968, Hofstra University
Linda Helene Nagrem Kripke, District of Columbia
Special Education
B.A. 1968, University of Pennsylvania
Stephen Alexander Lapko, Maryland
Secondary Education
B.A. in Ed. 1966, George Washington University
Jeffrey Herbert Ledewitz, Connecticut
Student Personnel Work in Higher Education
B.A. 1968, Stetson University
Eileen Frances Lehman, Virginia
Special Education
B.A. 1954, Dunbarton College of Holy Cross
Joan Patterson Lewis, Maryland
Curriculum
B.S. 1960, District of Columbia Teachers College
Randolph Manning, Maryland
Adult Education
B.A. 1965, George Washington University
Nancy Goldsmith Marks, Tennessee
Special Education
B.A. 1967, Newcomb College, Tulane University of Louisiana
James Edgar Marrow, District of Columbia
Guidance
B.S. 1953, North Carolina Agricultural and Technical State University
Kenneth Lee Martin, Virginia
Secondary Education
B.S. in Ed. 1962, Western Illinois University

- Doris Aileen McClain, Maryland
Reading
B.S. 1962, University of Maryland
- James McPhail, District of Columbia
Secondary Administration
B.S. 1950, Shaw University
- Sarah Yates Miller, Maryland
Reading
B.A. 1942, University of Maryland
B.S. 1954, Towson State College
- John Samuel Moshides, Virginia
Guidance
B.A. 1957, East Carolina University
- Mary Louise Tulley Mott, New York
Adult Education
B.S. 1957, George Washington University
- Anne Marie Murphy, Virginia
Special Education
B.S. 1960, State University of New York at Buffalo
- Pamela Ruth Murray, Massachusetts
Early Childhood Education
B.A. 1968, Boston College
- Lylla Adelle O'Bryon, Virginia
Rehabilitation Counseling
B.A. 1941, Mount Allison University, Canada
- Elsie Shaw O'Grady, Virginia
Secondary Education
B.S. 1937, Boston University
- Carla Oliveri, Massachusetts
Student Personnel Work in Higher Education
B.A. in Ed. 1968, State College at Salem
- Judith Miller Osteen, Maryland
Curriculum
B.S. 1966, University of Maryland
- Gwendolyn Jane Wongus Page, Maryland
Elementary Education
B.S. 1961, District of Columbia Teachers College
- Eugene Posati, Virginia
Physical Education
B.S. in P.E. 1961, George Washington University
- Carol Waller Preston, District of Columbia
Guidance
B.A. 1951, Morgan State College
- Thomas Richard Rae, Maryland
Physical Education
B.S. 1964, University of Maryland
- Clara Mae Rodgers, District of Columbia
Secondary Administration
B.S. 1961, District of Columbia Teachers College
- Sandra Arlene Goldstein Rusk, Virginia
Secondary Education
B.A. 1965, Indiana University
- Linda Keighley Short, Virginia
Special Education
B.A. in Ed. 1965, George Washington University
- M. Sharon Shur, Pennsylvania
Student Personnel Work in Higher Education
B.A. 1968, Temple University
- Patricia Pink Siegel, Maryland
Reading
B.A. 1962, Western Maryland College
- Floyd Wayne Sigler, Maryland
Student Personnel Work in Higher Education
B.S. 1966, Towson State College
- Joan Simon, New York
Special Education
B.S. in Elem.Ed. 1968, Syracuse University
- Ilene Sinsky Solomon, Maryland
Special Education
B.A. 1966, University of Maryland
- Ravis Gilbert Stickney, Maryland
Physical Education
B.S. in Ed. 1960, University of Alabama
- Sidney-Ann Roberts Sullivan, District of Columbia
Rehabilitation Counseling
B.A. in Ed. 1961, George Washington University
- Burnadine Williams Taylor, District of Columbia
Elementary Administration
B.S. 1952, Virginia State College
- Joyce Elaine Taylor, New York
Rehabilitation Counseling
B.S. 1967, Howard University
- Charles Jefferson Thompson, Maryland
Elementary Administration
B.A. 1957, University of North Carolina at Chapel Hill
- Carolyn Cynthia Ayers Thrift, Maryland
Special Education
B.S. 1966, Bowie State College
- William Lee Timberlake, Jr., Virginia
Physical Education
B.S. 1962, University of Virginia

- Clyde Eugene Travis, Sr., District of Columbia
Secondary Administration
B.S. 1950, Howard University
- Maria Corazon J. Villegas-Tiglao, Philippines
Human Growth and Development
B.A. 1952, B.S.E. 1959, Manuel L. Quezon University, Philippines
- Jacqueline Mary Waddy-Lewis, Maryland
Early Childhood Education
B.S. 1966, District of Columbia Teachers College
- Samuel Wakefield, District of Columbia
Secondary Administration
B.S. in Ed. 1966, West Chester State College
- Virginia Rollins Wallace, North Carolina
Elementary Education
B.A. 1965, Mars Hill College
- Esther Jackson Washington, Virginia
Elementary Education
B.A. 1957, Virginia Union University
- Carole Brooks Webster, Maryland
Elementary Education
B.S. 1967, Towson State College
- William Richard Wells, Virginia
Physical Education
B.S. in P.E. 1960, George Washington University
- Barbara Manbeck Whitehill, Pennsylvania
Student Personnel Work in Higher Education
B.S. 1967, Mansfield State College
- Karoline Kincaid Wilson, Texas
Guidance
B.A. 1951, University of Texas at Austin
- Pauline Francis Wilson, District of Columbia
Guidance
B.S. in Com. 1948, Lincoln University, Mo.
- Daniel Allen Yates, Maryland
Elementary Administration
B.S. 1966, Frostburg State College
- Robert Francis Yeager, Virginia
Secondary Administration
B.S. 1965, West Chester State College
- Janet Slade Young, District of Columbia
Secondary Administration
B.S. 1965, District of Columbia Teachers College
- John Philip Zier, Maryland
Physical Education
B.S. in P.E. 1964, George Washington University

EDUCATION SPECIALIST

- Ilene Ruth Boone, District of Columbia
Guidance
B.A. 1963, Lake Forest College
Ed.M. 1968, Johns Hopkins University
- Nancy Love Cole, Virginia
Guidance
B.A. 1962, Ed.M. 1966, American University
- Lucia Mahlstedt Gross, Virginia
Guidance
B.S. 1956, Oklahoma State University
Ed.M. 1967, American University
- Martin Louis Mounier, Virginia
Early Childhood Education
B.A. 1965, Ed.M. 1966, Florida Atlantic University
- Phyllis Fahrney Raynor, Maryland
Reading
B.A. in Ed. 1963, M.A. in Ed. 1965, George Washington University
- Carol Meads Thomas, Delaware
Guidance
B.A. in Ed. 1938, M.A. in Ed. 1965, George Washington University
- Anthony Lawrence Verge, Maryland
Curriculum
B.A. in Ed. 1964, Fairmont State College
M.A. 1965, West Virginia University

DOCTOR OF EDUCATION

- Charmaine Lisée Ciardi, Maryland
Special Education
Dissertation: *The Historical Development of Early Childhood Educational Programs Including Those for Exceptional Children: An Interpretive Study*
B.A. in Ed. 1964, M.A. in Ed. 1965, George Washington University
- Norman Eugene Hearn, Maryland
Teacher Education
Dissertation: *Innovative Educational Programs: A Study of the Influence of Selected Variables upon Their Continuation Following the Termination of Three-year ESEA Title III Grants*
B.A. 1949, M.A. 1951, University of Michigan
- James Louis Jones, District of Columbia
Guidance and Counseling
Dissertation: *A Study of the Perceptions of Male Counselees and Their Counselors in Urban High Schools*
B.S. in Ed. 1957, Howard University
M.A. in Ed. 1966, George Washington University
- William James McHenry, Virginia
Guidance and Counseling
Dissertation: *A Study of the Use of the Life Career Game in Junior High School Group Guidance*
B.S. in Ed. 1959, Lock Haven State College
Ed.M. 1964, Pennsylvania State University
- Betty Bibb Ware, Virginia
Guidance and Counseling
Dissertation: *A Pilot Study of a Vocational Decision-making Workshop for College Students*
B.A. 1947, Ed.M. 1960, Longwood College
- Elizabeth Bouey Yates, District of Columbia
Teacher Education
Dissertation: *Changing Attitudes and Behavior: Guidelines for the In-service Education of Social Studies Teachers in the Secondary Schools of the District of Columbia*
B.A. in Ed. 1943, Virginia Union University
M.A. in S.P.A. 1945, Columbia University

SCHOOL OF GOVERNMENT AND BUSINESS ADMINISTRATION

BACHELOR OF BUSINESS ADMINISTRATION

- | | |
|---|---|
| John Joseph Baldassari, Pennsylvania
Accounting | Gabriel Joseph Di Giantommaso,
New York
Accounting |
| William Herman Budke, Jr., District of
Columbia
Business Administration | John Robert Douglass, Virginia
Business and Economic Statistics |
| Harmon Evan Burns, Michigan
Business Administration | Yale Frederick Goldberg, District of
Columbia
Business Administration |
| Candace Mattoon Carroll, District of
Columbia
Business Administration
(With Distinction) | Ida Susan Gruits, Virginia
International Business |
| David Devlin Clement, Virginia
Business Administration | Arthur Gibson Howell, Virginia
Business Administration |
| Bernard Dennis Day, Maryland
Business Administration | Eui-Shin Kim, Korea
Business Administration |

Dorothy Louise Noble, Virginia
Business Administration
Danny Lou Retter, Virginia
International Business
Arthur Grant Robbins, Virginia
Accounting
David Allen Spiker, Virginia
Business Administration

Henry Wolcott Thomas III, District of
Columbia
Accounting
Steven Coleman Victor, Pennsylvania
Business Administration

BACHELOR OF SCIENCE IN GENERAL STUDIES

James Lewis Ball, Maryland
Business Administration
William Edsel Branscum, Virginia
Business Administration
James Ollen Bryan, Virginia
Business Administration
Jack Darling Fuller, Virginia
Business Administration
Ralph Nelson Hardin, Virginia
Business Administration
Michael Beach La Masters, Maryland
Business Administration
Clarice Chambliss Nickens, District of
Columbia
Business Administration
Get Garcia Ramos, Virginia
Business Administration

Charles Allen Reich, Virginia
Business Administration
Luther Henry Richmond, Jr., Virginia
Business Administration
Charles Edwin Showalter, Virginia
Business Administration
Robert William Smith, Florida
Business Administration
Donald Delbert Spoon, Virginia
Business Administration
Bruce Edwin Talcott, Maryland
Business Administration
(With Distinction)
Hollis Blackwell Taylor, Maryland
Business Administration
George Arthur Zink, Maryland
Business Administration

MASTER OF ARTS IN GOVERNMENT

John David Costello, Maryland
Public Administration
B.S. 1952, U.S. Coast Guard Academy
Jangaba Augustine Johnson, District of
Columbia
Public Administration
B.A. 1967, Gonzaga University

Betsy Burrage McCarthy, Massachusetts
Public Administration
B.A. 1963, University of Massachusetts

MASTER OF BUSINESS ADMINISTRATION

William Smoot Antle, Jr., Maryland
Business Administration
B.S. 1940, U.S. Naval Academy
Bradley Edward Balles, New Jersey
Health Care Administration
B.A. 1966, Providence College
Robert Gustav Baxter, Pennsylvania
Business Administration
B.S. 1963, University of Maine
Sister Mary Evelyn Bederski, New Jersey
Health Care Administration
B.S. 1944, St. Louis University
Joseph John Francis Binkoski, Maryland
Business Administration
B.S. in S.S. 1962, Loyola College

Ralph William Blakeman, New York
Health Care Administration
B.S. 1964, Siena College
Kent Charles Borchers, Nebraska
Business Administration
B.A. 1963, Wayne State College
Samuel Boyd, Jr., Maryland
Accounting
B.B.A. 1962, Wake Forest University
Kenneth George Boyles, District of
Columbia
Business Administration
B.S. in Hotel Adm. 1964, Cornell
University

- Roland Keith Bullard II, Pennsylvania
International Business
B.A. 1966, George Washington University
- George Scruggs Bullen, Jr., Virginia
Business Administration
B.A. 1965, Fordham University
- John David Colangelo, Virginia
Business Administration
B.S. in B.A. 1959, Georgetown University
- Dayton Clarence Cramer, Florida
Business Administration
B.B.A. 1966, University of Miami
- William Scott Davenport, New Jersey
Business Administration
B.B.A. 1967, St. Bonaventure University
- Jacob Roy Degenhardt, Jr., Pennsylvania
International Business
B.S. 1962, U.S. Military Academy
- William Francis Donovan, Jr., Colorado
Business Administration
B.S. in Bus. 1966, University of Colorado
- Raymond Andrew Dubriske, Virginia
Business Administration
B.S. in Com. 1941, University of Notre Dame
- William Mack Edmondson, Jr., Virginia
International Business
B.A. 1957, East Carolina University
- Alexander Hamilton Evans, Rhode Island
Business Administration
B.S. 1961, U.S. Military Academy
- John Thomas Evans, Jr., West Virginia
Health Care Administration
B.S. 1966, West Virginia University
- Bogdan Herbert Fabrycy, District of Columbia
International Business
B.B.A. 1968, George Washington University
- Leon Sangster Fiske, Jr., Hawaii
Business Administration
B.B.A. 1953, University of Hawaii
- John Edward Flannery, Maryland
Business Administration
B.S. 1962, University of Scranton
- Clara Freeman Forbis, District of Columbia
Business Administration
B.A. 1967, Bennington College
- Michael George Gero, New York
Business Administration
B.A. 1965, Union College
- Donald Harry Giffin, Colorado
Business Administration
B.A. 1963, Colorado College
- Malcolm Blake Greenlee, Maryland
Business Administration
B.S. 1956, Purdue University
- Kenneth Dale Griffiths, Illinois
Business Administration
B.A. 1958, University of Utah
- Leonard David Hagerty, Maryland
Business Administration
B.S. in Foreign Trade 1956, University of Detroit
- George Dennis Hartnett, Massachusetts
Health Care Administration
B.S. 1964, Boston College
- Walter Eads Hines III, Virginia
Business Administration
B.S. 1958, University of Tennessee
- Hollie Richard Hodges, Texas
Business Administration
B.S. in B.A. 1960, Morris Harvey College
- Douglass Chester Horstman, Virginia
International Business
B.A. 1966, George Washington University
- Robert Francis Hughes, Virginia
Business Administration
B.B.A. 1961, Le Moyne College
- Dominique Louis Huret, France
International Business
Diplome 1968, Ecole Superieure des Sciences, Economiques et Commerciales, Paris, France
- Ralph Gene Kabureck, Illinois
Business Administration
B.S. 1968, Washington University
- John Robert Knight, Maryland
Business Administration
B.A. 1968, George Washington University
- Louis Henry Lauch, Jr., Ohio
Business Administration
B.B.A. 1968, University of Cincinnati
- Sister Anna Michael Lesicko, Missouri
Health Care Administration
B.S. in Nursing 1961, Marillac College
- Michael Peter John Letsky, Maryland
Business Administration
B.S. in E.E. 1967, Northeastern University
- Edward John Lucyk, Pennsylvania
Business Administration
B.S. 1964, U.S. Military Academy

- Raymond Joseph Mahach, Virginia
Business Administration
B.S. in B.A. 1957, Washington University
- Michael Edward Marigliano, New York
Health Care Administration
B.A. 1960, Queens College, N.Y.
- John Joseph McKechnie, Jr., Maryland
Business Administration
B.S. 1960, University of Maryland
- Bertel Robert Megill, District of Columbia
Business Administration
B.B.A. 1963, George Washington University
- Richard Alden Moore, Massachusetts
Business Administration
B.S. in B.A. 1960, Boston University
- Leslie James Morrisett, Georgia
Business Administration
B.B.A. 1966, University of Miami
- Richard Thomas Morse, Virginia
Business Administration
B.S. 1959, Rochester Institute of Technology
- Reginald Prescott Walden Murphy, District of Columbia
Business Administration
B.A. 1959, Stanford University
- Amarie Capili Natividad, District of Columbia
International Business
B.S. in Com. 1958, Far Eastern University, Philippines
- Souad Selim Nouralla, North Carolina
Business Administration
B.Com. 1962, Cairo University, Egypt
- Peter Grant Odell, New York
Business Administration
B.S. 1962, U.S. Naval Academy
- Sister Theresa Marian Peck, Illinois
Health Care Administration
B.S. in Nursing 1959, Marillac College
- Charles Louis Rech, Virginia
Business Administration
B.S. 1960, St. Vincent College
- John Edward Reid, Kentucky
Health Care Administration
B.S. 1962, Ohio State University
- Lois Katherine Ribich, Minnesota
International Business
B.A. 1968, George Washington University
- Thomas Elsworth Richards, Maryland
Accounting
B.B.A. 1965, George Washington University
- Leonard Joseph Saper, Virginia
Business Administration
B.B.A. 1962, Tulane University of Louisiana
- Leonard Joseph Schossler, Virginia
International Business
B.S. in B.A. 1966, Ohio State University
- Walter Jerome Seelig III, Virginia
Business Administration
B.A. 1966, University of Virginia
- Paul Daniel Smith, Maryland
Business Administration
B.A. 1967, Johns Hopkins University
- Glenn Moore Spitzer, Jr., Virginia
Business Administration
B.B.A. 1966, George Washington University
- Robert James Stankard, Maryland
Business Administration
B.S. 1961, University of Dayton
- William Edward Stanton, Maryland
Business Administration
B.A. in Govt. 1960, George Washington University
- Richard Phillips Straley, New Jersey
Business Administration
B.A. 1961, College of William and Mary
- Will Eugene Straver, Virginia
International Business
B.S. in B.A. 1964, Washington University
- William Joseph Sullivan, Virginia
International Business
B.B.A. 1958, Northeastern University
- George Swasey, District of Columbia
International Business
B.A. 1963, Colby College
- Michael George Vergamini, Iowa
Business Administration
B.S. in B.A. 1963, Creighton University
- Alan Jay Warshawer, Virginia
Business Administration
B.S. 1954, University of Maryland
- Robert Watt, Louisiana
Business Administration
B.S. 1964, University of Maryland
- John Thomas Westermeier, Jr., Virginia
Business Administration
B.S. 1963, U.S. Military Academy
- Gerald Regis Wetzel, Indiana
Business Administration
B.S. 1958, University of Notre Dame
- Sister Mary Eileen Wilhelm, Maryland
Health Care Administration
B.A. 1964, Mount St. Agnes College

Mark Joseph Worrick, Pennsylvania
Business Administration
B.A. 1965, Arkansas Polytechnic
College
Alexander Yaney, Jr., Virginia
Health Care Administration
B.S. 1938, St. Thomas College, Pa.

Robert Stewart Young, Virginia
Business Administration
B.S. in F.S. 1950, Georgetown
University

MASTER OF PUBLIC ADMINISTRATION

John Clayton Hoyle, Maryland
Public Administration
B.A. 1955, Georgetown University

Michael Francis Walsh, Virginia
Public Administration
B.A. 1960, Boston College

MASTER OF SCIENCE IN ADMINISTRATION

Frank Marshall Adamson, Jr.,
Pennsylvania
Management Engineering
B.S. 1959, U.S. Naval Academy
John Cecil Bender, Washington
Management Engineering
B.S. 1963, U.S. Naval Academy
Edward Douglas Bjorn, New York
Automatic Data Processing
B.A. 1954, College of the Holy Cross
Raymond Aloysius Delahanty, Jr.,
Virginia
Industrial Personnel Management
B.A. 1953, Boston University
Bruce Morkman Ericksen, Maryland
Governmental Administration
B.S. 1957, Iowa State University of
Science and Technology
Alan Gold, New York
Automatic Data Processing
B.A. 1966, Hofstra University
Gordon Milner Haggard, Virginia
Systems Management
B.A. 1957, Indiana University
John Hugh Hoey, Virginia
Management Engineering
B.S. 1959, U.S. Naval Academy
David Otto Kauppi, Minnesota
Automatic Data Processing
B.S. in Bus. 1964, University of
Minnesota

William John Kros, Nebraska
Automatic Data Processing
B.S. in Com. 1952, Creighton
University
Arthur Lawrence Lambert, Virginia
Management Engineering
B.S. 1942, U.S. Military Academy
Milton LeRoy Little, Virginia
Industrial Personnel Management
B.A. 1957, Texas Christian University
William Benedict Nolde, Michigan
Management Engineering
B.S. 1964, Central Michigan University
John Ward Reed, Virginia
Management Engineering
B.S. 1938, U.S. Naval Academy
John David Rieser, Maryland
Governmental Administration
B.Gen.Ed. 1960, University of
Nebraska at Omaha
Joseph Earl Sammons, Virginia
Industrial Personnel Management
B.S. 1952, U.S. Naval Academy
Enar Hilt Sanders, Virginia
Management Engineering
B.B.A. 1966, Southern Methodist
University
Ronald von Freymann, Virginia
Automatic Data Processing
B.S. 1964, U.S. Military Academy
Alvin William Washington, Texas
Management Engineering
B.S. 1950, Lincoln University, Mo.
M.S. 1958, Ohio State University

MASTER OF SCIENCE IN BUSINESS ADMINISTRATION

Jesse Milton Allen, Maryland
B.S. 1949, University of Illinois

Jimmie B. Allred, Louisiana
B.A. 1951, University of Mississippi

- Richard Lee Anderson, Kansas
B.A. 1962, Chico State College
- William Augustus Arata III, New Jersey
B.S. 1958, U.S. Naval Academy
B.S. in M.E. 1965, U.S. Naval Postgraduate School
- Parker Duvall Archibald, Virginia
B.S. in I.E. 1948, Virginia Polytechnic Institute
- Walter John Bodman, Jr., Virginia
B.Gen.Ed. 1965, University of Nebraska at Omaha
- Toria Joel Bratten, Jr., Tennessee
B.S. 1944, U.S. Naval Academy
- Richard Shelley Brooks, Virginia
B.S. in Gen.Std. 1968, George Washington University
- James Thomas Carbine, Jr., District of Columbia
B.S. 1946, U.S. Military Academy
- Charles Van Choyce, Virginia
B.S. 1960, Tulane University of Louisiana
- Edward Ciulis, Virginia
B.A. 1966, George Washington University
- Daniel John Copans, Virginia
B.A. 1951, Union College
- John Edward Cottongim, Texas
B.S. 1947, U.S. Military Academy
- Harold Bruce Croskery, Virginia
B.S. 1954, American University
- Walter Lafayette Dberty, Jr., Virginia
B.A. 1958, University of Colorado
- Paul Robert Doty, Ohio
B. of Ae.E. 1946, University of Minnesota
- Sam Aaron Dressin, Virginia
B.S. 1943, U.S. Naval Academy
B.S. 1955, M.S. 1956, U.S. Naval Postgraduate School
- William Kenneth Farmer, Virginia
B.S. in Ed. 1962, Oglethorpe University
- Gonzalo Fernandez, Virginia
B.S. 1947, U.S. Military Academy
M.S. in Astr.Engr. 1964, Air Force Institute of Technology
- George Carlisle Gatje, Virginia
B.Ae.E. 1952, M.S. in Ae.E. 1958, Rensselaer Polytechnic Institute
- Edwin Bernard Gentry, Virginia
B.E.E. 1951, North Carolina State University at Raleigh
M.S. in E.E. 1957, Stanford University
- Werner Grosshans, California
B.A. 1958, San Jose State College
- Robert Spalding Hamilton, Virginia
B.S. 1964, University of Maryland
- John Robert Hansen, Virginia
B.S. 1949, University of Wisconsin
- John Marshall Henschman, Virginia
B.A. 1951, University of Washington
- Wilfred Monroe Howerton, Virginia
B.A. 1941, University of Montana
Naval Engr. 1950, Massachusetts Institute of Technology
- James Richard Iversen, Virginia
B.S. 1945, U.S. Coast Guard Academy
- Robert Whitman Johnson, Virginia
B.S. 1958, University of California, Los Angeles
- Ralph Ward Jones, California
B.Gen.Ed. 1960, University of Nebraska at Omaha
- Edwin Elwood Kelly, Virginia
B.B.A. 1953, University of Miami
- Fred George Kennedy, Jr., Alabama
B.A. 1963, Virginia Military Institute
- Clifford Earle Keys, Jr., Virginia
B.A. 1950, Eastern Nazarene College
- Laurence Gerald Kohler, Virginia
B.S. in I.E. 1959, Ohio State University
- James Louis Lammie, Virginia
B.S. 1953, U.S. Military Academy
M.S.E. 1957, Purdue University
- John Duane Lee, Alabama
B.S. in Com. 1954, North Dakota State University
- Lynwood Bridger Lennon, Texas
B.S. 1950, Wake Forest University
- Samuel Alexander Lewis, Virginia
B.S. 1959, Michigan State University
- Richard Eugene Livingston, Jr., Maryland
B.S. in Ed. 1953, Pennsylvania State University
- Warren Douglas Magnusson, Virginia
B.S. 1947, University of Pennsylvania
- William Otis McDaniel, Virginia
B.S. in Gen.Std. 1968, George Washington University
- Roy William McLaine, Jr., Virginia
B.A. 1958, Stanford University
- Philip Cummings McMullen, Maryland
B.S. 1949, U. S. Military Academy
M.S.E. 1960, University of Michigan
- Walter Edwin Meinzen, Virginia
B.S. 1948, U.S. Military Academy
M.S. 1963, Mississippi State University
- James Albert Minish, Virginia
B.A. 1961, University of Colorado
- Cleo Nordean Mitchell, Jr., Virginia
B.S. 1944, U.S. Naval Academy

- Lawrence Paul Monahan, Jr., Virginia
B.S. 1949, U.S. Military Academy
M.S.E. 1955, University of Michigan
- Robert Luston Moore, Oklahoma
B.S. 1952, Virginia Polytechnic Institute
B.S. in C.E. 1959, University of Missouri at Rolla
- Richard Aaron Nagelhout, Maryland
B. Marine Engr. 1956, State University of New York, Maritime College
- Alfred Arthur Pabst, Virginia
B.S. 1948, U.S. Military Academy
M.A. 1961, Columbia University
- Herbert Carson Pinkerton, Virginia
B.S. 1947, U.S. Military Academy
- William Edward Poling, New York
B.S. 1952, Manhattan College
- Jack Isador Posner, Virginia
B.B.A. 1948, City College, New York
LL.B. 1951, New York Law School
M.A. 1955, Columbia University
- Donovan Bernard Quigley, Virginia
Ph.B. 1950, Marquette University
- Maurice John Raffensperger, District of Columbia
B.S. in E.E. 1952, M.S. in E.E. 1953, Stanford University
- Philip Rahall, Missouri
B.S. 1947, St. Louis University
- Herbert Emil Reichert, Virginia
B.A. 1948, Villanova University
- Ernest Richard Reid, Jr., District of Columbia
B.B.A. 1962, University of Hawaii
- William Curtis Rice, Virginia
B.S. in M.E. 1948, Virginia Polytechnic Institute
M.S. in Ae.E. 1956, Air Force Institute of Technology
- Theodore Scott Riggs, Jr., Virginia
B.S. 1963, University of Maryland
- Bob Roark, Virginia
B.S. in Com. 1949, University of Kentucky
- Kenneth L. Robinson, Jr., Virginia
B.A. 1950, Boston College
- Paul Roth, Virginia
B.S. 1949, U.S. Merchant Marine Academy
- Irving Bernard Schoenberg, Missouri
B.S. 1948, U.S. Military Academy
- Robert Henry Schwarz, Virginia
B.S. 1949, U.S. Military Academy
- Robert Ambrose Shade, Virginia
B.S. 1950, U.S. Military Academy
M.S. 1958, U.S. Naval Postgraduate School
- John Michael Shea, Virginia
B.S. 1951, Boston College
- Daniel Joseph Shearin, Virginia
B.A. 1949, Pennsylvania State University
- Joseph Peter Smolinski, Jr., Virginia
B.A. 1959, George Washington University
- Macon St. Clair Snowden, Virginia
B.S. 1945, U.S. Naval Academy
- Richard Eugene Stadelbacher, Alabama
B.S. 1960, Ohio State University
- Samuel Clark Thornburg, New Mexico
B.B.A. 1950, Southern Methodist University
- William Bowden Turnage, Arkansas
B.S. in E.E. 1961, Louisiana Polytechnic Institute
- Clarence Murphy Watters, Virginia
B.S. 1950, U.S. Military Academy
- Randall Kahuekaiakea White, Alabama
B.B.A. 1956, University of Hawaii
- Alonzo Edwin Wood, Jr., Virginia
B.S. 1948, Virginia Polytechnic Institute
- Harris Harold Woods, Illinois
B.S. 1946, U.S. Military Academy
- Charles Vanderdeer Yarbrough, Virginia
B.S. 1952, U.S. Military Academy

MASTER OF SCIENCE IN FINANCIAL MANAGEMENT

- Glenn William Coleman, Maryland
B.S. 1960, U.S. Naval Academy
- John Frederick Hardesty, Virginia
B.S. 1952, U.S. Naval Academy
M.S. 1960, U.S. Naval Postgraduate School
- Bobby Ray Lang, Virginia
B.S. in Mil.Sci. 1963, University of Maryland
- Charles William Lawson, Maryland
B.S. in Gen.Std. 1967, George Washington University

MASTER OF SCIENCE IN GOVERNMENTAL ADMINISTRATION

Roger Hilton Alderman, Georgia
 B.A. 1967, Georgia Southern College
 Melvin Dean Schiller, Virginia
 B.A. 1960, Georgia State College

Richard Eric Turnau, Maryland
 B.A. 1958, Hofstra University

MASTER OF SCIENCE IN PERSONNEL ADMINISTRATION

Donald Clay Bayly, Maryland
 B.S. 1945, U.S. Naval Academy
 M.S. 1952, U.S. Naval Postgraduate School
 David Lawrence Bean, Maryland
 B.A. 1964, Carson-Newman College
 Charles William Blyth, Maryland
 B.S. 1956, University of Maryland
 M.A. 1962, San Diego State College
 Frank Joseph Breth, Pennsylvania
 B.S. 1959, Virginia Military Institute
 Alexander Smith Brough, Jr., Maryland
 B.B.A. 1962, University of Massachusetts
 Matthew Terry Cooper, Maryland
 B.S. 1958, U.S. Naval Academy
 Charles Glenn Crafton, Jr., Maryland
 B.S. in C.E. 1955, Clemson University
 John Beveridge Farrell, Hawaii
 B.S. 1950, U.S. Naval Academy
 Alfred Anthony Favero, Virginia
 B.B.A. 1964, University of Wichita
 James Howard Gaul, California
 B.S. 1962, U.S. Naval Academy

Joseph Michael Gilligan, New Jersey
 B.A. 1958, Seton Hall University
 Walter Herman Goedeke, Virginia
 B.S. 1965, State University of New York, College at Plattsburgh
 Arnold Courtney Hayward, Georgia
 B.A. 1954, Western Maryland College
 Irving William Munroe, Wisconsin
 B.S. 1964, University of Maryland
 James Gerald Murphy, Maryland
 B.A. 1950, Duquesne University
 Paul Dean Rogers, Virginia
 B.S. 1961, U.S. Merchant Marine Academy
 Harry Paul Salmon, Jr., New Jersey
 B.S. 1963, U.S. Naval Academy
 Charles DeFitseurse Sarkiss, Georgia
 B.S. 1956, U.S. Military Academy
 Terry Alan Wallace, Montana
 B.A. 1964, University of Washington
 Sidney Earl Wheeler, Maryland
 B.S. 1962, U.S. Naval Academy

MASTER OF SCIENCE IN PUBLIC ADMINISTRATION

Allen Bennett, Jr., Texas
 B.S. in Ed. 1953, Texas Technological College

GRADUATE CERTIFICATE IN HEALTH CARE ADMINISTRATION

Gerald Saul Goldberg, Maryland
 B.A. 1960, Harvard University
 M.A. 1962, Johns Hopkins University

DOCTOR OF BUSINESS ADMINISTRATION

Paul Charles Ergler, Maryland
 Dissertation: *A Study of Contract Engineering as Used in Technical Manpower Management in the Baltimore, Maryland—Washington, D.C., Area*
 B.S. in M.E. 1941, M.S. in Engr.Mgt. 1962, Drexel Institute of Technology

SCHOOL OF PUBLIC AND INTERNATIONAL AFFAIRS

BACHELOR OF ARTS

- | | |
|---|---|
| Michael Andrew Mottern Bertin,
New York
Public Affairs | Chelun Huang, New York
International Affairs |
| Robert B. Bowie, California
International Affairs | Sanguan Keophumihae, Virginia
International Affairs |
| Barbara Arnold Buehler, Virginia
International Affairs | Elizabeth M. Marshall, Virginia
International Affairs |
| Lawrence Myers Cauble, Jr., Oregon
International Affairs | Stephen Harris Parry, Jr., Virgin Islands
International Affairs |
| Robert Charles Fox III, California
International Affairs | Michael Heinrich Wilhelm Rittmann,
Maryland
International Affairs |
| Peter Joseph Gosnell, Virginia
International Affairs | Walter Tighe, Iowa
Public Affairs |
| Diana Blackmon Henriques, New Jersey
International Affairs
(With Distinction) | Karen Louise Whalen, New Jersey
International Affairs |

MASTER OF ARTS

- | | |
|---|--|
| Mary-Lee Strother Carter, Alabama
International Affairs
B.A. 1966, Auburn University | Costas Papademas, District of Columbia
International Affairs |
| James Dewing Chapman, Virginia
International Affairs
B.A. 1962, University of Connecticut | Susan Tepper Papadopoulos,
Massachusetts
International Affairs
B.A. 1966, Radcliffe College |
| Harry E. Gerhard, Virginia
International Affairs
B.A. 1968, George Washington
University | Charles Leslie Updegraph, Jr., Virginia
International Affairs
B.A. 1964, Hobart College |
| Steven Deyo Greiner, Virginia
International Affairs
B.A. 1965, Franklin and Marshall
College | |

MASTER OF SCIENCE IN INTERNATIONAL AFFAIRS

- | | |
|---|--|
| John Warren Adams, Indiana
B.S. 1958, U.S. Naval Academy | Raymond John Art, Ohio
B.S. 1959, U.S. Naval Academy |
| Charles Doughty Allen, Jr., District
of Columbia
B.S. 1946, Yale University | Frederick Clark Badger, Rhode Island
B.S. 1946, U.S. Military Academy
M.S. 1950, California Institute of
Technology |
| Kenneth Edward Allery, Virginia
B.A. 1966, Park College | Richard William Bailey, Rhode Island
B.A. 1959, St. Anselm's College |
| Richard Gustaf Altmann, Rhode Island
B.S. in B.A. 1964, Roosevelt
University | Craig Luther Barnum, New York
B.S. 1957, U.S. Naval Academy
M.A. 1965, George Washington
University |
| Donald Ralph Anderson, Pennsylvania
B.S. 1959, Villanova University | Clyde Beauchamp Bell, Jr., Tennessee
B.S. 1949, U.S. Military Academy |
| Stephen Oscar Armstrong, Jr., Georgia
B.S. 1966, U.S. Naval Postgraduate
School | |

- Harry William J.R. Bergbauer, Jr.,
Pennsylvania
B.S. 1953, U.S. Naval Academy
M.A. 1968, Monterey Institute of
Foreign Studies
- John William Bian, Illinois
B.S. 1958, St. Joseph's College, Ind.
- William Walter Bigler, Rhode Island
B.S. 1956, U.S. Naval Academy
- Thomas Cushman Bird, Florida
B.A. 1955, Heidelberg College
- Richard Wood Boehm, District of
Columbia
B.A. 1950, Adelphi University
- Stanley Gene Bonta, Rhode Island
B.S. 1957, Eastern Kentucky
University
- Richard Joseph Brennan, Rhode Island
B.S. 1961, U.S. Naval Postgraduate
School
- Russell Benjamin Bridgham, Florida
B.S. 1951, Maine Maritime College
B.S. 1963, U.S. Naval Postgraduate
School
- Edward Joseph Bronars, Virginia
B.S. 1950, U.S. Naval Academy
- Bruce Kilroy Brown, Virginia
B.S. 1952, U.S. Naval Academy
- Robert Theodore Browne, Texas
B.A. 1953, Texas A&M University
- Richard Lowrie Brummage, Texas
B.S. 1953, U.S. Naval Academy
B.S. in E.E. 1962, U.S. Naval
Postgraduate School
- Edward Oliver Buchanan, Rhode Island
B.S. 1954, University of Southern
California
- Wilbur Jennings Burgin, Rhode Island
B.Gen.Std. 1968, University of
Nebraska at Omaha
- William Lofton Burns, Georgia
B.A. 1960, American University
- Richard Edward Busby, Rhode Island
B.J. 1954, University of Texas at
Austin
- Olva Barland Butler, Louisiana
B.S. 1968, Troy State University
- William Elmer Carlson, Florida
B.S. in Agriculture 1951, University
of Florida
- George Arthur Carlton, New York
B.S. 1957, Columbia University
- Donald Eugene Carson, Rhode Island
B.S. in B.A. 1952, Tulane University of
Louisiana
M.B.A. 1962, Northwestern University
- John Patrick Casey, Jr., Florida
B.S. 1961, University of Southern
Mississippi
- Richard Francis Casey, Massachusetts
B.A. 1956, Tufts University
- Edwin William Chamberlain, Jr.,
Maryland
B.A. 1968, University of Maryland
- John Drew Chamberlain, California
B.A. 1958, University of Southern
California
- LaVerne Leon Cheney, Colorado
B.Gen.Ed. 1961, University of
Nebraska at Omaha
- Robert Chin, District of Columbia
B.A. 1949, LL.B. 1951, George
Washington University
- James Stuart Clare, Rhode Island
B.S. 1965, U.S. Naval Postgraduate
School
- Clyde Othniel Clark, Virginia
B.Gen.Ed. 1961, University of
Nebraska at Omaha
- Douglas Hoyt Clifton, Virginia
B.S. 1945, U.S. Coast Guard
Academy
- Bruce Larry Cloud, Pennsylvania
B.S. 1954, Juniata College
- Arthur Frank Cochran, Virginia
B.S. 1951, Oklahoma State University
- Marvin Colbs, District of Columbia
B.S. 1950, Temple University
- David Donald Colcombe, Pennsylvania
B.S. 1957, University of Delaware
- Keith Paul Collard, Rhode Island
B.A. 1954, San Diego State College
- Joseph Easterbrook Collins, Idaho
B.S. 1946, U.S. Military Academy
- William Penn Crum, Texas
B.S. 1956, U.S. Military Academy
- Paul Otto Cutchen, Florida
B.S. in Agriculture 1953, University
of Florida
- James Chester Davis, Jr., Alabama
B.A. 1956, The Citadel
- Thomas Edwards Davis, Arkansas
B.S. 1962, U.S. Naval Postgraduate
School
- Frank Ligon Day, Rhode Island
B.S. 1956, U.S. Military Academy
M.S.E. 1964, Purdue University
- Eugene Peyton Deatrick, Jr., West
Virginia
B.S. 1946, U.S. Military Academy
- Oscar Conrad Decker, Jr., Ohio
B.S. in B.A. 1951, University of
Nebraska at Lincoln

- William Lawrence Depew, California
B.S. 1951, U.S. Military Academy
- Robert George DeVine, New York
B.A. 1967, George Washington University
- Jay Norman Dewing, Virginia
B.S. 1951, U.S. Naval Academy
- Kenneth Ray Dickey, Rhode Island
B.A. 1957, University of Southern California
- William Francis Doehler, Virginia
B.S. 1944, U.S. Naval Academy
- Edward Francis Doherty, Massachusetts
B.S. 1957, Boston University
- Philip Francis Dorman, District of Columbia
B.A. 1948, Stanford University
- Melville Anson Drisko, Jr., Rhode Island
B.S. 1958, U.S. Military Academy
- Alfred Frank Eaton, Mississippi
B.B.A. 1958, University of Pittsburgh
- Philip Henry Edmunds, Rhode Island
B.S. in C.E. 1951, Marquette University
- B.S. in E.E. 1964, U.S. Naval Postgraduate School
- David Joe Ellison, Oklahoma
B.A. 1957, University of California, Berkeley
- James Byron Fackenthall, Alabama
B.A. in B.A. 1957, Rutgers, the State University
- Philip Robert Feir, Virginia
B.S. 1949, U.S. Military Academy
- M.S. in E.E. 1960, Georgia Institute of Technology
- John Frederic Felter, Rhode Island
B.A. 1954, Dartmouth College
- Harry Kenneth Fiske, Rhode Island
B.S. 1958, Tufts University
- Robert Michael Forster, New Jersey
B.S. 1956, U.S. Naval Academy
- B.S. 1963, U.S. Naval Postgraduate School
- Evarts Cranson Fox, Jr., Rhode Island
B.A. 1955, University of Colorado
- John Frederick Frost III, Virginia
B.S. 1953, U.S. Naval Academy
- M.S. 1960, U.S. Naval Postgraduate School
- Robert Lloyd Funseth, Virginia
B.A. 1948, Hobart College
- Joseph Aloysious Gabriel, Illinois
B.A. 1966, University of Maryland
- William Bruce Garrett, Kansas
B.S. 1959, U.S. Naval Academy
- John Lee Gawf, Colorado
B.S. 1945, U.S. Naval Academy
- Richard Lee Gehle, California
B.A. 1949, Occidental College
- Troy Hescue George, Jr., California
B.A. 1956, Stanford University
- Lewis Henry Goad, Virginia
B.Gen.Ed. 1964, University of Nebraska at Omaha
- Kelsey Brice Goodman, Texas
B.S. 1953, University of Houston
- Warner Seymour Goodwin, Jr., Rhode Island
B.Gen.Ed. 1951, North Carolina State University at Raleigh
- Clinton Edwin Granger, Jr., Rhode Island
B.S. 1951, U.S. Military Academy
- Alvin Chris Gross, Jr., Pennsylvania
B.S. 1958, U.S. Naval Academy
- Paul Bentley Haigwood, North Carolina
B.S. in Com. 1947, University of North Carolina at Chapel Hill
- M.A. 1963, George Washington University
- Robert Alton Hall, Illinois
B.A. 1956, University of Illinois
- Keith Chance Hanna, Texas
B.Gen.Ed. 1963, University of Nebraska at Omaha
- Robert Edward Harshbarger, Virginia
B.S. 1950, Roanoke College
- Herbert Maurice Hartlove, Pennsylvania
B.S. 1949, U.S. Coast Guard Academy
- William Moulton Hartness, North Carolina
B.A. 1959, George Washington University
- Joffre Armand Heineck, Rhode Island
B.S. 1940, University of Chicago
- Eugene O'Brien Henderson, Virginia
B.A. 1951, Bowdoin College
- M.B.A. 1958, Stanford University
- James Manson Henderson, Jr., Tennessee
B.S. 1958, Tennessee Technological University
- Henry Frank Herbig III, Rhode Island
B.S. 1956, Massachusetts Institute of Technology
- Diego Edyl Hernandez, Rhode Island
B.S. 1955, Illinois Institute of Technology
- Charles William Herzig, Rhode Island
B.A. 1960, Seton Hall University

- William James Hickman, California
B.S. 1966, U.S. Naval Postgraduate School
- John Francis Hillen, Jr., Virginia
B.B.A. 1959, City College, New York
- Carl Charles Hilscher, Virginia
B.S. 1962, U.S. Naval Postgraduate School
- Ronald Victor Himelick, Indiana
B.S. 1958, Ohio State University
- Lovic Pierce Hodnette, Jr., Alabama
B.S. 1950, U.S. Naval Academy
- Leon Erwin Hoffer, Jr., Ohio
B.S. in Com. 1958, Ohio University
- Walter Vincent Hogan, Rhode Island
B.S. 1953, U.S. Naval Academy
B.S. in Ae.E. 1962, U.S. Naval Postgraduate School
- Frederick Stacer Holmes, Jr., Rhode Island
B.S. 1956, U.S. Military Academy
M.S. 1962, Massachusetts Institute of Technology
- Edward Young Holt, Jr., Texas
B.S. 1947, U.S. Naval Academy
M.B.A. 1966, George Washington University
- Neil Gary Holt, Florida
B.S. 1966, U.S. Naval Postgraduate School
- Robert Edward Howard, Jr., Virginia
B.S. in AeE., M.S. in Ae.E. 1963, U.S. Naval Postgraduate School
- Robert Wayne Howland, Ohio
B.A. 1951, Miami University
M.S. in Mgt. 1963, U.S. Naval Postgraduate School
- Thomas Moore Huddleston, Virginia
B.S. 1946, U.S. Military Academy
- Walter Newit Israel, Virginia
B.Gen.Ed. 1965, University of Nebraska at Omaha
- George Lester Jackson, Rhode Island
B.A. 1954, University of Redlands
- George Eugene Jacobssen, Jr., Rhode Island
B.A. 1960, University of California, Berkeley
- Joseph Newton Jagers, Jr., Alabama
B.S. 1952, U.S. Military Academy
- Robert Young Kaufman, Maryland
B.S. 1945, U.S. Naval Academy
- James Laflin Kelly, Virginia
B.S. 1950, U.S. Military Academy
M.S. 1956, California Institute of Technology
- Robert Charles Kingston, Massachusetts
B.Gen.Std. 1965, University of Nebraska at Omaha
- David Paul Kirchner, Rhode Island
B.A. 1951, Tulane University of Louisiana
- John Ward Kirkland, Rhode Island
B.S. 1952, Carnegie-Mellon University
M.S. 1956, Rennselaer Polytechnic Institute
- Steven Edman Kish, Washington
B.S. 1953, U.S. Merchant Marine Academy
- Joseph Edward Klause, Pennsylvania
B.A. 1958, University of Pennsylvania
- Charles Hillard Knight, Florida
B.A. 1958, University of North Carolina at Chapel Hill
- Richard Jost Koch, Jr., New York
B.A. 1955, Harvard University
- William Henry Lanagan, Jr., Rhode Island
B.A. 1961, George Washington University
- Lyle Franklin Lane, Washington
B.A. 1950, University of Washington
- Roger Philip Larivee, Louisiana
B.S. 1959, University of Maryland
- Maurice Eugene Lee, Virginia
B.J. 1949, University of Missouri
- John Michael Leeds, Rhode Island
B.S. 1959, U.S. Naval Academy
- Charles Philip Leiner, Jr., District of Columbia
B.S. in Engr. 1951, San Diego State College
J.D. 1967, George Washington University
- James Maxwell Leslie, Utah
B.S. 1951, Montana State University
- John David Lewis, California
B.S. 1948, Virginia Polytechnic Institute
- James Robert Lilley, New Jersey
B.S. 1947, U.S. Military Academy
- John Robert Lincoln, Missouri
B.S. 1955, Southeast Missouri State College
- Clarence Eugene Mackey, California
B.A. 1964, George Washington University
- William Thomas Marin, Rhode Island
B.S. 1951, U.S. Naval Academy
B.S. in E.E. 1960, U.S. Naval Postgraduate School
- Leo Joseph Marshall, Virginia
B.S. 1966, University of Maryland

- Lucian Charles Martinez, Florida
B.A. 1951, Florida State University
- Stephen Joseph McArdle, Jr., Rhode Island
B.A. 1963, U.S. Naval Postgraduate School
M.S. in Per. Adm. 1965, George Washington University
- James Adams McCaig, Virginia
B.A. 1948, Washburn University of Topeka
- Robert Brock McClinton, Virginia
B.S. 1947, U.S. Naval Academy
- Wesley Lee McDonald, Virginia
B.S. 1946, U.S. Naval Academy
- William Robert McDowell, Rhode Island
B.S. 1950, U.S. Military Academy
- James Joseph McGrath, Rhode Island
B.A. 1956, University of Washington
- Jon Consitt McKenzie, Rhode Island
B.A. 1953, University of Notre Dame
- William Oral McLean, Rhode Island
B.S. 1957, University of New Mexico
- Jerry Charles McMurry, Rhode Island
B.S. 1959, U.S. Naval Academy
- Daniel Edward McPherson, Jr., California
B.S. 1948, University of New Hampshire
- Jack Edward McQueston, Michigan
B.S. 1951, U.S. Naval Academy
- Eric Alton McVadon, Rhode Island
B.A. 1958, Tulane University of Louisiana
- Theodore Edward Metzger, Rhode Island
B.A. 1959, University of Iowa
- William Owen Miller, Georgia
B.S. 1946, University of South Carolina
LL.B. 1949, Atlanta Law School
LL.M. 1964, George Washington University
- Kenneth Young Millian, District of Columbia
B.A. 1951, University of Maryland
- John Roger Mitchell, Indiana
B.S. 1957, U.S. Coast Guard Academy
- William David Munsey, Arizona
B.A. 1963, George Washington University
- Arthur Neukom Nehf, Jr., Arizona
B.S. in B.A. 1941, University of Arizona
- Alan Andrew Nord, South Dakota
B.S. 1952, South Dakota State University
M.A. 1958, Oxford University, England
- Charles Robert Norris, District of Columbia
B.A. 1949, Syracuse University
M.B.A. 1962, Lehigh University
- Owen Henry Oberg, Virginia
B.A. 1957, Stanford University
- John Patrick O'Connell, California
B.S. 1946, University of California, Berkeley
- Edward Cornelius O'Connor, Virginia
B.A. 1952, Boston College
M.S. 1966, University of North Carolina at Chapel Hill
- Charles Gunter Olentine, Arkansas
B.S. 1949, U.S. Military Academy
M.S. 1955, Massachusetts Institute of Technology
- Donald Charles Ord, Rhode Island
B.Gen.Std. 1968, Rollins College
- George William Orton, Arkansas
B.S. 1951, U.S. Military Academy
- Robert Bell Osborne, Rhode Island
B.S. 1958, University of Southern California
- Michael Noel O'Sullivan, Virginia
B.A. 1964, George Washington University
- Thomas Rogers Overdorf, Pennsylvania
B.S. 1951, Pennsylvania State University
- Frederick Fraser Palmer, Virginia
B.S. 1963, U.S. Naval Postgraduate School
- William White Palmer, Virginia
B.S. 1950, U.S. Military Academy
- Robert Franklin Peek, Rhode Island
B.A. 1956, University of North Carolina at Chapel Hill
- David Stanley Penniman, New Hampshire
B.S. 1958, University of New Hampshire
- René Edmond Plante, Rhode Island
B.B.A. 1955, University of Miami
- Walter William Plummer, Jr., District of Columbia
B.S. 1948, U.S. Military Academy
- Daniel Bruce Plyler, Virginia
B.S. 1949, Clemson University
- Donald Trisler Poe, Missouri
B.S. 1944, U.S. Naval Academy

- Richard St. Francis Post, Connecticut
B.A. 1951, Harvard University
- Roger Everett Powell, Kentucky
B.A. 1958, Davidson College
- William Paul Putorek, Jr., Pennsylvania
B.Gen.Ed. 1962, University of Nebraska at Omaha
- Lucian Russell Rawls, Jr., South Carolina
B.S. 1962, University of Maryland
- William Otto Rennhack, Maryland
B.S. 1948, Northwestern University
M.B.A. 1959, Air Force Institute of Technology
- Clifton Silas Ridgway, Tennessee
B.S. 1959, University of Maryland
- John Thomas Robison, Rhode Island
B.A. 1943, University of North Carolina at Chapel Hill
- Arnold Schlossberg, Jr., Virginia
B.A. 1958, Virginia Military Institute
- Fred Clifton Sheffey, Virginia
B.S. 1950, Central State College, Ohio
M.B.A. 1962, Ohio State University
- William Raymond Sheridan, Rhode Island
B.S. 1950, College of the Holy Cross
M.S. in E.E. 1957, U.S. Naval Postgraduate School
- Frank Mathias Smith, Louisiana
B.S. 1958, U.S. Military Academy
- Grant Ronald Smith, Virginia
B.A. 1948, University of California, Berkeley
M.S. 1955, University of Oregon
- James Donald Smith, Florida
B.S. 1957, U.S. Military Academy
- Richard John William Smith, Rhode Island
B.S. 1954, Marquette University
- Ronald Elmer Smith, Rhode Island
B.S. 1954, Rose Polytechnic Institute
- Ronald Edward Sorna, Rhode Island
B.A. 1966, San Francisco State College
- Edwin Lee Stanford, Ohio
B.A. 1957, Ohio Wesleyan University
- Robert Keith Starling, Virginia
B.A. 1949, Cornell University
- Henry Barthold Stelling, Jr., California
B.S. 1948, U.S. Military Academy
M.B.A. 1965, University of Southern California
- Dennis Silver Strole, Rhode Island
B.A. 1957, Roanoke College
- James Owen Sullivan, Rhode Island
B.S. 1958, U.S. Coast Guard Academy
- Joe Edward Tarlton, Rhode Island
B.S. 1953, U.S. Naval Academy
- Charles Gordon Tate, Rhode Island
B.S. in Ed. 1952, Southern Illinois University
- Mervin Merle Taylor, California
B.S. 1947, Pepperdine College
- Henry Joseph Tessandori, Virginia
B.A. 1957, St. Bonaventure University
- Robert Ward Thompson, Rhode Island
B.S. 1946, U.S. Naval Academy
- Francis Hatherly Thurston, Rhode Island
B.Aviation Mgt. 1967, Auburn University
- John Henry Touchton, Jr., Florida
B.A. 1965, U.S. Naval Postgraduate School
- James Sterling Grimes Turner, Indiana
B.S. in Mil.Sci. 1959, University of Maryland
- Jerry Owen Tuttle, Rhode Island
B.S. 1963, U.S. Naval Postgraduate School
- Guy Isbell Tutwiler, Arkansas
B.Gen.Ed. 1961, University of Nebraska at Omaha
- Michael Tymchak, Florida
B.S. in Mil.Sci. 1960, University of Maryland
- Louis Thaddeus Urbanczyk, Jr., New York
B.S. 1947, U.S. Naval Academy
- Hoyt Sanford Vandenberg, Jr., Virginia
B.S. 1951, U.S. Military Academy
- John James Walsh, Jr., New York
B.S. in Ed. 1956, University of Georgia
M.A. 1965, George Washington University
- Eugene Einar Wanglie, Rhode Island
B.A. 1964, U.S. Naval Postgraduate School
- Volney Frank Warner, South Dakota
B.S. 1950, U.S. Military Academy
M.A. 1960, Vanderbilt University
- Dean Edwin Webster, Florida
B.B.A. 1958, Tulane University of Louisiana
- Harold Nixon Wellman, Colorado
B.S. 1951, University of Denver
- James Keating Welsh, Jr., New Hampshire
B.S. 1948, U.S. Naval Academy
- Alexander Blake Wilson, District of Columbia
B.A. 1964, Miami University

Almon Chapman Wilson, New York
M.D. 1952, B.A. 1968, Union College
and University
David Glenn Wilson, Mississippi
B.S. in M.E. 1954, Tulane University
of Louisiana
B.S. in E.E. 1964, U.S. Naval
Postgraduate School
Peyton Randolph Wise II, California
B.S. 1953, U.S. Naval Academy
M.A. 1961, Johns Hopkins University
Richard Walker Wood, North Carolina
B.S. 1954, Duke University

Jack David Woodall, Florida
B.S. in Bus. 1958, Stetson University
Edwin Elmore Woods, Jr., Vermont
B.S. 1949, U.S. Naval Academy
Theodore Kennedy Woods, Jr., Virginia
B.A. 1956, LL.B. 1959, University
of Virginia
Robert Palmer Wray, California
B.S. 1959, University of Nebraska
at Omaha
George Moomaw Wysor, Virginia
B.A. 1948, University of Virginia

Winter Convocation, February 21, 1970

COLUMBIAN COLLEGE OF ARTS AND SCIENCES

Student Marshal: Anne Kramer

ASSOCIATE IN ARTS

Thomas Asa Coons, Virginia
Annie Mae Hearon, Virginia

Laura Lee Lapko, Maryland
Henry Charles John Ziegler, Bermuda

BACHELOR OF ARTS

Carl Brunt Bailey, Virginia
English Literature
Anthony Francis Barbieri, Jr., District
of Columbia
Political Science
Mary Brittain Bardes, Ohio
Political Science
Sally-Ann Baynard, Virginia
Germanic Languages and Literatures
Sylvia Teodozia Beattie, North Carolina
English Literature
Robert Saul Becker, New York
Political Science
Martha Margaret Berulis, District of
Columbia
Fine Arts
Deborah Lee Biggs, Virginia
Political Science
James Harrison Blondell, Virginia
History
Janet Ellen Bratter, Virginia
English Literature
Scott Whittlesey Brinckerhoff, District
of Columbia
Political Science

Jane McIntosh Britt, Georgia
Political Science
Samuel Lee Brothers, Virginia
Zoology
Fatma Selmin Can, Virginia
English Literature
Ann Baxter Canedy, Maryland
American Literature
Laurel Dee Cooper, Pennsylvania
Speech Pathology and Audiology
Joan Irene Nadel Coppola, District of
Columbia
Speech Pathology and Audiology
Janice Darlene Crawford, District of
Columbia
Psychology
Caroline Lee Crippin, Maryland
English Literature (Special Honors)
Roberta Lydia Davies, New Hampshire
Philosophy
Lloyd Evan Davis, District of Columbia
Psychology
Caryl Scarlett Day, Maryland
English Literature

- Daniel Joseph Demers, Nevada
 History
 Margaret Kloman Doane, Virginia
 Social Sciences
 Judy Rose Dornbush, Utah
 Fine Arts
 Theodore Elvis Dorris, Tennessee
 Social Sciences
 Carolyn Royall Dunnagan, Alabama
 Political Science
 Elizabeth Joan Duquette, Alaska
 Dramatic Art
 Richard Gary Epstein, New Jersey
 Mathematics (With Distinction)
 Diana Cutting Eyer, District of Columbia
 Political Science
 James Christopher Farley, Jr., New Jersey
 Economics
 Diane Margaret Fiala, New Jersey
 English Literature
 Gilda Ann Fisch, New York
 Anthropology
 Sally Ann Flanik
 Psychology (Special Honors)
 William Paul Fletcher, District of
 Columbia
 Sociology
 Susan Ann Fogg, Virginia
 English Literature
 Betty Ann Fridinger, Virginia
 Natural Sciences
 Dorothy Ilaine Fruchbom, Pennsylvania
 Sociology
 James Kenneth Gaynor, Jr., District of
 Columbia
 English Literature
 Alan Marshall Gibson, Maryland
 Psychology
 Stanley Barton Glick, New Jersey
 Psychology
 Donna Jean Cutler Greenberg, California
 Speech Pathology and Audiology
 Jane Briggs Hart, District of Columbia
 Anthropology
 Thomas Edward Hart, District of
 Columbia
 English Literature
 Sarah Lloyd Hartwell, New Hampshire
 French Language and Literature
 Jeffrey Robert Hellerbach, New Jersey
 Political Science
 Linden Roark Hill, Virginia
 American Civilization
 John Arthur Hoehn, Virginia
 English Literature
 Albert Daniel Howell, Maryland
 Political Science
 Paul Herbert Janov, New York
 Sociology
 Lloyd Clark Johnson, Virginia
 Psychology
 Paul William Johnson, Maryland
 Social Sciences
 Diane Lea Kenney, Virginia
 Psychology
 Nancy Ruth Koller, California
 Speech Pathology and Audiology
 Anne Kramer, Pennsylvania
 Geology (With Distinction)
 Paul Michael Kuzma, Jr., Ohio
 Zoology
 Leslie Anne Lang, Virginia
 Political Science
 Toni Lynn Leon, New York
 Speech Pathology and Audiology
 James Christopher Levett, England
 History
 William Richard Lewis, District of
 Columbia
 Philosophy
 Sophia Elizabeth Lotowycz, New York
 Anthropology
 Gerald Welliver Lunt, Virginia
 Psychology
 Nancy Madison, New Jersey
 Russian Language and Literature
 (With Distinction)
 Susan Read Makoff, Virginia
 English Literature
 John Richard Manfra, New Jersey
 Psychology
 Robert Steven Marin, District of
 Columbia
 History
 Joel William Marsh, Connecticut
 Political Science
 William Aber McGeary, Pennsylvania
 Political Science
 Judith Anne Ellis McIntyre, Virginia
 American Civilization
 Carole Ilene Meyers, New York
 Fine Arts
 Faye Moskowitz, District of Columbia
 American Literature (Special
 Honors)
 Morris Donald Munsen, Jr., Maryland
 Spanish Language and Literature
 (With Distinction)
 Ronald Owen Nakashima, New Jersey
 Psychology

- Paul Robert Panitz, Maryland
 History
 Patricia Ann Parsons, New York
 Anthropology
 Harold Crockett Pillsbury III, Maryland
 Medicine
 Dolores Steeley Potter, Maryland
 Mathematics
 Gregory Murdock Rankin, Maryland
 Psychology
 Judyth Lynne Reichenberg, Missouri
 Spanish Language and Literature
 (Special Honors)
 LaMonia Orleigh Rivers, Virginia
 Natural Sciences
 Laura Lee Rucker, Virginia
 Psychology
 Tami Melissa Rudnick, Maryland
 Art History and Theory
 Arthur Stanley Russell, Virginia
 Social Sciences (With Distinction)
 Bogdan Bogdanovich Sagatov, Virginia
 Russian Language and Literature
 Ellen Sue Saldinger, New York
 History
 Allen Robert Schneider, Virginia
 Music History and Literature
 Aida Reid Schoenfeld, District of
 Columbia
 English Literature
 Sheila Evelyn Frazier Schrup, Virginia
 French Language and Literature
 Anne Clarkson Schulhof, District of
 Columbia
 Art History and Theory
 Stephanie Kaighn Scott, Massachusetts
 Philosophy
 Lenore Ann Seliger, Maryland
 Anthropology
 Nina Eugenia Serebrennikov, Virginia
 French Language and Literature
 Nancy Marie Sherwood, District of
 Columbia
 French Language and Literature
 (With Distinction)
 Robert Alfred Shoemaker, Jr., Maryland
 History
 Frank Curtis Smith, Maryland
 Social Sciences (With Distinction)
 Sheryl Ann Johnson Smith, Virginia
 Philosophy
 Wayne McDonald Snider, Virginia
 Sociology
 Klara Bonsack Soronen, District of
 Columbia
 Anthropology (With Distinction)
 Hidde Anthony Stauthamer, Ohio
 Political Science
 Carol Anne Steuerwald, District of
 Columbia
 Psychology
 David Henry Stringer, District of
 Columbia
 American Civilization
 Lila Diane Suna, New York
 Speech Pathology and Audiology
 Henry Bucher Swoope, Virginia
 Chemistry
 Geoffrey Willis Taylor, District of
 Columbia
 Political Science
 Susan Truett Trammell, Virginia
 English Literature (Special Honors)
 George Harry Treadwell III, Tennessee
 Anthropology
 Carl Saundres Valentine, Maryland
 History
 Martha Valerie van Ogtrop, District of
 Columbia
 English Literature
 Clemencia Vélez Vockrodt, District of
 Columbia
 Spanish Language and Literature
 (Special Honors)
 Esther Sue Vorona, Virginia
 Sociology
 Karin Ingrid Walser, District of Columbia
 History
 Sherrye Lynn Watkins, Virginia
 English Literature
 James Rogers Watson, Virginia
 History
 Graig Scott Weisbart, Colorado
 Political Science
 William Turner Whipple, Virginia
 Fine Arts
 Elizabeth Rust Williams, Virginia
 Journalism
 Stephanie Katrina Williams, New York
 Germanic Languages and Literatures
 Antonia Linda Frisch Wood, District of
 Columbia
 Political Science
 Becky Coulter Workman, District of
 Columbia
 Anthropology
 Margaret Ann Zaleski, District of
 Columbia
 Psychology
 David Joel Zimmerman, Maryland
 Fine Arts

BACHELOR OF SCIENCE

Allen Blair Corbett II, Michigan
Zoology

Janet Shields Dean, District of Columbia
Mathematics (With Distinction)

Carol Peterson North, Virginia
Biology

Lawrence Lee Pittman, Virginia
Mathematics

BACHELOR OF SCIENCE IN GENERAL STUDIES

John Oliver Bachert, Virginia
Political Science

Robert Earl Spruit, Virginia
Political Science

Arthur Edward Westmoreland, Virginia
Political Science

GRADUATE SCHOOL OF ARTS AND SCIENCES

MASTER OF ARTS

Gale Hussman Arnold, Arkansas
English Literature

B.A. 1958, Washington University
Walter Donovan Bailey, Virginia
History

B.A. 1966, Atlantic Christian College
Monica D. Bell, District of Columbia

Spanish Language and Literature
B.A. 1967, Texas Christian University
John Luick Brunner, District of Columbia

Political Science
B.A. 1964, DePaul University
Patricia Murphy Carter, District of
Columbia

English Literature
B.A. 1951, George Washington
University

Tandra Chaudhuri, District of Columbia
History

B.A. 1966, Vidya Sagar College for
Women, India

John Roger Desiderio, Jr., District of
Columbia

Political Science
B.A. 1964, University of Maryland

Judith Sarah Falken, Illinois
Speech Pathology and Audiology
B.A. 1968, George Washington
University

Judith Mercer Gappa, California
Musicology

B.A. 1968, George Washington
University

Rosalyn Vita Ghitler, Virginia
Speech Pathology and Audiology
B.S. 1958, Northwestern University

Estelle Louise Grudzinski, District of
Columbia

Spanish Language and Literature
B.A. 1968, George Washington
University

Alice Joyce Hall, Iowa
American Civilization

B.A. 1958, Mills College
John Mitchell Kirsch, Sr., Virginia

Sociology
B.A. 1950, Gannon College

Camille Smith Klein, Virginia
Speech Pathology and Audiology
B.A. 1967, George Washington
University

Gabriele Klika Leubecker, Maryland
Germanic Languages and Literatures
B.A. 1966, University of Vienna,
Austria

Rochelle Albin Levine, Maryland
Psychology

B.A. 1966, Hofstra University
Frank Lynford Lewis, Virginia

Economics
B.A. in Govt. 1960, George
Washington University

Dale Arthur Madden, Maryland
Mathematical Statistics

B.S. in Chem. 1955, M.S. in Ch.E. 1958,
Massachusetts Institute of Technology

Susan Lynne Hilzenrath Mark, Virginia
Speech Pathology and Audiology
B.A. 1968, George Washington
University

Marian Brooks Mason, Texas
Sociology
B.A. 1968, Howard University

Edith Petersilia Mayo, Virginia
 American Civilization
 B.A. 1961, George Washington
 University
 Warren Frederick Morris, District of
 Columbia
 Philosophy
 B.A. 1963, Northeastern University
 George Wesley Ogg, District of Columbia
 Economics
 B.A. 1954, Colgate University
 Todd Seitner Phillips, Maryland
 History
 B.A. 1968, George Washington
 University
 Myrna Jean Feinstein Sachs, District of
 Columbia
 Art History and Criticism
 B.A. 1966, University of Pennsylvania
 Frederick John Scheuren, District of
 Columbia
 Mathematical Statistics
 B.A. 1963, Tufts University
 Guy Stanley Shane, Virginia
 Psychology
 B.A. 1963, Washington and Jefferson
 College

Kent Burch Taylor, Virginia
 Psychology
 B.A. 1967, George Washington
 University
 John Lawrence Van Dyke, District of
 Columbia
 Psychology
 B.A. 1963, George Washington
 University
 Kristen Paige Perry Vesell, Pennsylvania
 History
 B.A. 1960, Mary Washington College
 of the University of Virginia
 Andrea Marie Vojtko, District of
 Columbia
 Mathematics
 B.S. 1964, College Misericordia
 Jeffrey Donald Vowles, Washington
 Latin American Studies
 B.A. 1957, University of Washington
 Thomas Spaulding Willard, Maryland
 English Literature
 B.A. 1967, George Washington
 University
 John Junior Williams, Maryland
 French Language and Literature
 B.A. 1955, Morgan State College
 Robert Motaño Zamora, Maryland
 Religion
 B.A. 1958, Loma Linda University

MASTER OF FINE ARTS

Humberto Jiminez, Virginia
 Painting
 B.F.A. 1956, Ohio University

MASTER OF MUSIC

Diana Roberts Molinari, District of
 Columbia
 Applied Music
 Mus.B. 1968, Peabody Institute of the
 City of Baltimore

MASTER OF SCIENCE

Jimmy Lee Bailey, Virginia
 Biochemistry
 B.A. 1958, Berea College
 Catherine Mei-chih Chang, District of
 Columbia
 Biochemistry
 B.S. 1960, Saint Mary College

Sevilla Delloson Detera, District of
 Columbia
 Biochemistry
 B.S. 1962, Mapua Institute of
 Technology, Philippines
 Patricia Gavin Glasgow, Maryland
 Biology
 B.A. 1964, University of California,
 Riverside

Arnold Chester Johnston, Maryland
Microbiology
B.S. 1954, University of Maryland
Ruby Kay Dawson Meyers, Maryland
Mathematics
B.S. 1966, Mary Washington College
of the University of Virginia
Herman Howard Miller, Louisiana
Pharmacology
B.S. 1967, Tulane University of
Louisiana

Jo-Anne Biggio Ruby, District of
Columbia
Anatomy
B.S. 1967, George Washington
University
Smith Sae Hoo, District of Columbia
Anatomy
B.A. 1966, Columbia Union College
Roberta Whiting Scherer, Maryland
Physiology
B.A. 1967, Thiel College
Patricia Ann Tatem, District of Columbia
Chemistry
B.S. 1967, Bennett College, N.C.

MASTER OF PHILOSOPHY

James Byron Christian, Florida
International Relations
B.A. 1959, University of Montana
Donald Louis Diffenbaugh, Virginia
Political Science
B.A. 1950, Huntington College
M.A. 1952, Indiana University
Paul Harold Douglas, Maryland
American Civilization
B.A. 1962, University of Connecticut
M.A. 1964, University of Oregon
Duane Conan Ellison, Maryland
History
B.A. 1958, M.A. 1964, University of
Pittsburgh
Theodore Frankel, Maryland
International Relations
B.A. 1943, Yeshiva University
M.A. 1945, Columbia University
Douglas Carleton Frechtling, District of
Columbia
Economics
B.A. 1965, Hamilton College
Jerry William Gaskill, Maryland
Mathematics
B.A. 1963, Oberlin College
M.A. 1967, George Washington
University
William Hugh Girvan, Maryland
Germanic Languages and Literatures
B.A. 1947, Hamilton College
M.A. 1949, Northwestern University
Robert Clyde Harmon, Virginia
Germanic Languages and Literatures
B.A. 1952, M.A. 1961, University of
Maine
Joseph Ellsworth Himes, Virginia
Physics
B.S. 1961, George Washington
University

Harley Ross Jordan, Maryland
Mathematical Statistics
B.S. 1951, University of Denver
Alvin Kaltman, Massachusetts
Political Science
B.A. 1960, University of the Philippines
M.S. 1964, Florida Institute of
Technology
Bert Levy, Maryland
Mathematical Statistics
B.S. 1962, District of Columbia
Teachers College
Ching-yuan Lin, Maryland
Economics
B.A. 1955, National Taiwan University
M.A. 1967, Vanderbilt University
Imre Megyesi, District of Columbia
Geology
Diploma in Geology 1955, Eotvos
Lorand University, Hungary
Wendell Beniah Nix, Virginia
Physics
B.S. 1958, Auburn University
Michael Warren Robbins, District of
Columbia
American Civilization
B.A. 1960, Colgate University
M.A. 1962, Johns Hopkins University
John Dallas Robertson, Virginia
History
B.A. 1950, Randolph-Macon College
S.T.B. 1952, Wesley Theological
Seminary
M.A. 1953, Vanderbilt University
Thomas Robert Robinson, Virginia
Economics
B.A. in Govt. 1965, George Washington
University

- Peter Burton Ross, District of Columbia
American Civilization
B.A. 1954, M.S. 1959, University of California, Los Angeles
M.F.A. 1967, University of Iowa
- William Eugene Snow, Jr., Dominican Republic
Economics
B.A. in Govt. 1965, George Washington University
- Anthony Joseph Sulvetta, Virginia
Economics
B.A. in Govt. 1966, M.A. 1968, George Washington University
- Jacqueline Horner Vergin, District of Columbia
American Civilization
B.A. 1954, College of St. Catherine
M.A. 1955, University of Minnesota
- Morton Werber, Maryland
Psychology
B.A. 1955, University of Maryland
M.A. 1960, American University

DOCTOR OF PHILOSOPHY

- Arthur Ian Alterman, Maryland
Psychology
Dissertation: *Mediation of Recall for Language-related Sequences in the Prelingually Deaf*
B.A. 1960, Temple University
M.S. 1962, Brown University
- Edith Howard Breen, Virginia
Psychology
Dissertation: *Intrinsic and Extrinsic Motivation in Changing Students' Study Methods*
B.A. 1957, Smith College
M.A. 1968, George Washington University
- Herbert Hsien Chu, Maryland
Mathematical Statistics
Dissertation: *Some Results on Tests of Hypotheses of Separate Families of Distribution by the Minimum Discrimination Information Statistic*
B.A. 1949, National Cheng-chi University, China
M.S. 1959, Oklahoma State University
- Max Harry Cohen, Massachusetts
Microbiology
Dissertation: *Immunity to Murine Leukemia Cells*
B.A. 1961, Columbia University
M.D. 1965, Harvard University
M.Phil. 1969, George Washington University
- Donald Lester Daoust, Virginia
Psychology
Dissertation: *An Investigation of Grouping in Serial Order Short-term Retention*
B.S. 1960, University of Utah
M.A. 1964, George Washington University
- Peter Harvey Fishman, District of Columbia
Biochemistry
Dissertation: *The Chemistry and Biology of Mutarotases*
B.S. 1961, Massachusetts Institute of Technology
M.S. 1967, George Washington University
- Eusan Lynn Gartner, New York
Biochemistry
Dissertation: *Endogenous Lipid Metabolism in the Isolated Perfused Rat Heart*
B.A. 1963, Goucher College
M.A. 1965, George Washington University

- John Peter Grothé, California
Political Science
Dissertation: *Attitude Change of American Tourists in the Soviet Union*
B.A. 1953, M.A. 1954, Stanford University
- Michael Martin Hart, Maryland
Pharmacology
Dissertation: *The Effect of o,p'-DDD on Steroid Production in the Adrenal Cortex of the Dog*
B.S. 1964, George Washington University
M.S. 1966, University of Michigan
- Estelle Diane Irizarry, Virginia
Spanish Literature
Dissertation: *Francisco Ayala: Relaciones entre su obra crítica y teórica con la ficción*
B.A. 1959, Montclair State College
M.A. 1963, Rutgers, the State University
- Adele Gillespie Jenney, Virginia
American Literature
Dissertation: *The Irvingesque Story in the United States, 1820-1860*
B.A. 1951, Vassar College
M.A. 1952, Yale University
- Robert Emil Karlson, Virginia
American Literature
Dissertation: *American Short Story Criticism, 1885-1919*
B.A. 1948, College of William and Mary
M.A. 1957, Middlebury College
- Charles Jacob MacLean, Maryland
Mathematical Statistics
Dissertation: *Statistical Inference within the Nonstationary Poisson Process*
B.S. 1958, University of Wisconsin
M.S. 1964, New York University
- Robert Franklin Marler, Jr., Pennsylvania
American Literature
Dissertation: *The American Tale and Short Story, 1850-1861*
B.S.E. 1954, Princeton University
M.A. 1961, George Washington University
- Yehuda Molk, District of Columbia
Mathematical Statistics
Dissertation: *On Estimation of Probabilities in Contingency Tables with Restrictions on Marginals*
M.S. 1959, Hebrew University, Jerusalem
- Maxie Jo Nelson, Virginia
Biochemistry
Dissertation: *DDT: A Study of Its Role as an Inducer of Protein Synthesis at the Macromolecular Level*
B.S. 1962, Mary Washington College of the University of Virginia
M.S. 1967, M.Phil. 1969, George Washington University
- James William Pavlik, Illinois
Chemistry
Dissertation: *Photochemical and Thermal Addition of 9,10-Anthraquinone Dioxide to Alkenes and the Chemistry of Spirocyclopropane Anthrone Adducts*
B.A. 1959, Carthage College
M.S. 1961, Virginia Polytechnic Institute

- Walter George Pohl, District of Columbia
 Psychology
 Dissertation: *Dissociation of Spatial Discrimination Deficits Following Frontal and Parietal Lesions in Monkeys*
 B.A. 1959, M.A. 1964, George Washington University
- Steven Louis Rodis, Maryland
 Biochemistry
 Dissertation: *The Effect of Carnitine on Lipid Metabolism of the Rat Heart*
 B.A. 1963, Centre College of Kentucky
 M.Phil. 1969, George Washington University
- Ira Edward Rosenberg, Maryland
 Chemistry
 Dissertation: *The Photochemical Rearrangement of Substituted Phenyl Ethyl Carbonates: A Photo-Fries Type Rearrangement*
 B.A. 1963, Hunter College
 M.S. 1966, University of Maryland
- Judith Anne Segal, District of Columbia
 Economics
 Dissertation: *The Allocation of Public Funds to Improve the Diet of Low-income Families*
 B.A. in Govt. 1957, M.A. 1961, George Washington University
- Mukund Jethalal Shah, Maryland
 Chemistry
 Dissertation: *Chromatographic and Spectroscopic Studies of the Oxidation Products of p-Phenylenediamine and Resorcinol*
 B.S. 1958, M.S. 1960, Maharaja Sayajirao University of Baroda, India
 M.S. 1965, Catholic University of America
- Charles Wesley Swisher, South Carolina
 Psychology
 Dissertation: *A Comparison of Color Flicker, Brightness Flicker, and Residual Brightness Flicker in Heterochromatic Flicker Fusion*
 B.A. 1962, M.S. 1963, M.Phil. 1969, George Washington University
- James Ogden Wells II, District of Columbia
 Psychology
 Dissertation: *An Experimental Study of the Assignment of Responsibility for Unintentioned, Subintentioned, and Intentioned Death*
 B.S. 1962, Tufts University
 M.A. 1965, George Washington University
- Andrew George Yartzoff, California
 Chemistry
 Dissertation: *Structural Studies of Tetrahydrogossypibetilene and Gossypibetilene, Terpenes from Jatropha gossypifolia L.*
 B.S. 1954, University of the Pacific
 M.S. 1956, Stanford University

NATIONAL LAW CENTER

Student Marshal: Kieron Finian Quinn

JURIS DOCTOR

Richard Alan Appelbaum, Florida
 (With Honors)
 B.S. 1961, U.S. Coast Guard Academy

Richard Pearce Arnold, Virginia
 B.A. 1967, Indiana University of
 Pennsylvania

- Gerald Edgar Baker, Maryland
B.A. 1962, North Park College and
Theological Seminary
M.A.T. 1964, Northwestern University
- Gary Michael Baxter, District of
Columbia
B.S. 1967, Arizona State University
- Steven Ross Bechtel, Florida
(With Honors)
B.A. 1967, Tulane University of
Louisiana
- Patricia Louise Brown, Maryland
(With Honors)
B.A. 1966, George Washington
University
- Charles Pollard Cocke, Virginia
B.S. in Com. 1965, University of
Virginia
- Alan Edward D'Appolito, Maryland
(With Honors)
B.A. 1967, University of Maryland
- Jo Benson Fogel, Maryland
B.A. 1966, Duke University
- Don Louis Harding, Idaho
B.B.A. 1964, George Washington
University
- William Harold Hodge, Maryland
(With Honors)
B.S. in E.E. 1963, University of
Arkansas
M.S. in E.E. 1965, University of New
Mexico
- John David Holum, District of Columbia
(With Honors)
B.S. 1963, Northern State College
- Susan Jennifer Johnson, District of
Columbia
B.S. 1963, University of Pennsylvania
- Edward Joel Kessler, Virginia
B.S. (E.E.) 1967, George Washington
University
- Richard Allen Killworth, Virginia
(With Honors)
B.S. 1965, M.A. 1966, Purdue
University
- Daryll Norman Love, District of
Columbia
(With Honors)
B.A. 1963, University of Minnesota
- Joseph Raymond Lundy, Illinois
(With Honors)
B.A. 1962, Princeton University
- John James Pagano III, Maryland
B.A. 1967, Bucknell University
- Harry Lee Ponder III, District of
Columbia
B.A. 1964, University of Arkansas
- Kieron Finian Quinn, District of
Columbia
(With Honors)
B.S. in F.S. 1963, Georgetown
University
- Billy Wayne Richardson, Virginia
(With Honors)
B.S. 1963, U.S. Coast Guard Academy
- Victor Siber, Virginia
B.E.E. 1964, Pratt Institute
M.S. 1966, Rensselaer Polytechnic
Institute
- Gary Audric Smith, Maryland
B.A. 1967, University of Maryland
- John M. Stuckey, Jr., Virginia
(With Honors)
B.A. 1961, M.A. 1963, Louisiana
State University
- William Hugh Townsend, New York
B.A. 1963, University of North
Carolina at Chapel Hill
M.B.A. 1965, Syracuse University
- Tyson Wade Whiteside, Virginia
B.A. 1966, University of Kansas

MASTER OF LAWS

- John David Atlas, New Jersey
B.A. 1965, University of Miami
LL.B. 1968, Boston University
- James Baird, Virginia
Labor Law (With Highest Honors)
B.A. 1965, Michigan State University
J.D. 1968, University of Wisconsin
- Richard Sanford Becker, District of
Columbia
(With Highest Honors)
B.A. 1964, Miami University
J.D. 1967, University of Michigan
- Marshall Fox Berman, Virginia
Labor Law (With Highest Honors)
B.A. 1961, University of Virginia
J.D. 1967, American University
- David Ellis Blabey, New York
B.A. 1965, Hamilton College
J.D. 1968, Cornell University
- Harvey Samuel Brosler, Virginia
Government Procurement Law
B.S. 1959, University of Connecticut
LL.B. 1966, Eastern College

- J. Winston Bryant, Arkansas
 B.A. 1960, Ouachita Baptist University
 LL.B. 1963, University of Arkansas
 Michael Allen Collora, Pennsylvania
 (With Highest Honors)
 B.A. 1965, University of Virginia
 LL.B. 1968, Harvard University
 Fronefield Crawford, Jr., District of
 Columbia
 B.A. 1965, Williams College
 LL.B. 1968, Yale University
 Roger Henry Dusberger, Illinois
 B.S. 1964, J.D. 1966, University of
 Illinois
 Richard Lapsley Griffin, Virginia
 Taxation
 B.S. 1950, LL.B. 1952, University
 of North Carolina at Chapel Hill
 M.B.A. 1968, Inter-American
 University of Puerto Rico
 Radwan A. Jabri, Virginia
 Public International and
 Comparative Law
 (With Highest Honors)
 LL.B. 1965, University of Aleppo,
 Syria
 M.C.L. 1968, University of Miami
 John Bennett Jones-Bateman, New York
 (With Highest Honors)
 B.S. 1955, U.S. Coast Guard Academy
 LL.B. 1968, University of Maryland
 Anis Fowzi Kassim, District of Columbia
 Public International and
 Comparative Law
 (With Highest Honors)
 License in Law 1965, University of
 Damascus, Syria
 M.C.L. 1968, University of Miami
 James John Keightley, Virginia
 Taxation
 B.A. 1964, Villanova University
 LL.B. 1967, Cornell University
 David Lee Mahan, Maryland
 B.A. 1963, University of Kentucky
 LL.B. 1966, Indiana University
 Bruce Lowry McDonald, Maryland
 Administrative Law: Economic
 Regulation (With Highest Honors)
 B.A. 1963, LL.B. 1966, Harvard
 University
 John Sanders Miller III, New York
 Government Procurement Law
 B.A. 1959, Hamilton College
 LL.B. 1962, University of Virginia
 Richard Paul Noland, Texas
 B.A. 1965, J.D. 1966, University of
 Texas at Austin
 Joseph Michael Quinlan, New York
 B.S.S. 1963, Fairfield University
 J.D. 1966, Fordham University
 Eric Scott Sirulnik, Massachusetts
 B.A. 1965, Franklin and Marshall
 College
 J.D. 1968, Boston University
 Richard William Tomeo, Virginia
 Taxation
 B.A. 1963, LL.B. 1966, University
 of Connecticut

MASTER OF COMPARATIVE LAW

- Joselito Bucoy de Leon, Virginia
 B.A. 1962, Ateneo de Zamboanga,
 Philippines
 LL.B. 1966, Ateneo de Manila,
 Philippines

MASTER OF COMPARATIVE LAW (American Practice)

- Leonardo Luis Bravo, Maryland
 Doctor of Civil Law 1942, University
 of Havana, Cuba
 Jorge Fernandez, Virginia
 Doctor en Derecho 1952, University
 of Havana, Cuba

DOCTOR OF JURIDICAL SCIENCE

Kuang-Hsung Joseph Chuang, Maryland
International Trade

Dissertation: *A Composite Study of Legal Aspect to Investment in China (Republic of), Japan, Korea (Republic of), and Philippines*

LL.B. 1964, Soochow University, Taiwan

LL.M. 1966, Chung-Hsing University, Taiwan

LL.M. 1968, University of California, Berkeley

SCHOOL OF ENGINEERING AND APPLIED SCIENCE

Student Marshal: Rodolfo Laporta

BACHELOR OF SCIENCE (Civil Engineering)

Rodolfo Laporta, District of Columbia
Humberto Arturo Olivero, District of
Columbia

Jack Albert Schaeffer, District of
Columbia
William Robert Schafer, Virginia

BACHELOR OF SCIENCE (Electrical Engineering)

Leonard Benjamin Sirota, Massachusetts

BACHELOR OF SCIENCE (Mechanical Engineering)

Bijan Modaressi, Virginia

MASTER OF ENGINEERING ADMINISTRATION

David Joseph Bilger, Maryland
B.E.E. 1964, Georgia Institute of
Technology

Walter John Burmeister, Virginia
B.S. 1961, Virginia Polytechnic
Institute

George Robert Ciavarella Cavell,
California
B.S. 1948, Yale University

Ralph Willard Cooley, Maryland
B.S. 1958, University of Maryland

Charles Edwin Couchman III, Maryland
B.S. in M.E. 1963, University of
Maryland

John Francis Doheny, Maryland
B.S. 1946, U.S. Naval Academy
B.S. in E.E. 1957, U.S. Naval
Postgraduate School

Joseph James Fortuna, Maryland
B.S. 1960, Allegheny College

George Dobroslav Halushynsky,
Maryland
B.S. in E.E. 1956, Case Western
Reserve University

Robert Green Kugler, Jr., Maryland
B.A. 1966, B.E. 1967, Rutgers, the
State University

Adel Mahmoud Labib, Pennsylvania
B.E.E. 1965, George Washington
University

Boris Levine, Maryland
B.M.E. 1934, Polytechnic Institute
of Brooklyn

John Merrill Lord, District of Columbia
B.S. in E.E. 1964, Norwich University

John Joseph Marino, Virginia
B.S. in E.E. 1963, University of Detroit

Thomas Lawrence McFadden, Virginia
B.E.E. 1962, Villanova University

John Edward Moye, Maryland
B.S. in E.E. 1961, Newark College of
Engineering

Frank Karl Price, Maryland
B.S. in E.E. 1964, Newark College
of Engineering

Jorge Vicente Ribas, Maryland
B.M.E. 1963, Catholic University of
America

Richard Gerald Rothman, Maryland
B.S. in E.E. 1964, University of
Maryland
Jacob Sakwa, Maryland
B.S. 1961, University of Maryland

Vytas Albert Tarulis, District of
Columbia
B.E.E. 1965, George Washington
University

MASTER OF SCIENCE

Chafe Omar Abou-Richeh, Lebanon
Networks
B.S. (E.E.) 1968, George Washington
University
Emad Abdel-Moneim Akkoush, District
of Columbia
Civil Engineering
B.C.E. 1968, Cairo University, Egypt
Terence Harold Brennan, Ohio
Measurement Science
B.A. 1962, Villa Madonna College
Capers Rembert Cockrell, Virginia
Communications
B.S. in E.E. 1963, University of South
Carolina
Robert Lewis Drummond, Virginia
Communications
B.S. in E.E. 1962, University of
Maryland
Carl Eric Espeland, Jr., Virginia
Fields and Waves
B.S. in E.E. 1966, University of
Maryland
John Howard Falconer, Maryland
Communications
B.E.E. 1962, Gannon College
Ely Gerson Fishlowitz, Maryland
Structural Mechanics
B.S. (C.E.) 1965, George Washington
University
Robert Lee Hinebaugh, Ohio
Electronics
B.S. 1963, Ohio Northern University
Joseph Peter Hirl, Maryland
Computer Science
B.S. in E.E. 1959, University of
Notre Dame
Donald Everett Jones, Maryland
Mechanical Engineering
B.M.E. 1959, General Motors Institute
George Ihor Kiebusinski, Maryland
Controls and Systems
B.S.E. 1959, University of Connecticut
Joseph Lee Kirk, Virginia
Operations Research
B.S. in Economics, Politics, and
Engineering 1964, Massachusetts
Institute of Technology

Gerald Edward Kissel, Maryland
Communications
B.S. in E.E. 1968, Purdue University
Burton Ralph Klein, Massachusetts
Electronics
B.S. in E.E. 1965, Tufts University
Joseph Edward Knepley, Maryland
Controls and Systems
B.E.E. 1960, Villanova University
William Francis Koch, Maryland
Communications
B.E.E. 1964, Villanova University
Arthur Webster Lucas, Jr., Maryland
Mechanical Engineering
B.S. (M.E.) 1969, George Washington
University
Jasper Giuseppe Maltese, Maryland
Operations Research
B.S. 1961, Fairleigh Dickinson
University
Donald Lee McClure, Maryland
Electronics
B.S. 1962, North Carolina Agricultural
and Technical State University
Maurice Millman, Maryland
Operations Research
B.S. 1960, California State Polytechnic
College, San Luis Obispo
Javad M. Nilforoush, District of
Columbia
Structural Mechanics
B.E. 1963, American University of
Beirut, Lebanon
William Thomas Packard II, New York
Mechanical Engineering
B.S. (M.E.) 1969, George
Washington University
Benjamin Henry Penniston, Maryland
Controls and Systems
B.M.E. 1961, Pratt Institute
Charles Quintavell, Jr., Virginia
Communications
B.S. in E.E. 1959, Newark College of
Engineering
Ronald Emerson Ruksznis, Maryland
Computer Science
B.S. in E.E. 1967, University of Maine

Aaron Arthur Sanders, Ohio
Measurement Science
B.S. 1962, University of Michigan
John Moody Saunders, Virginia
Networks
B.E.E. 1966, George Washington
University
Vincent John Serafino, Virginia
Communications
B.S. in E.E. 1964, Drexel Institute of
Technology

James Ahmed Walker, District of
Columbia
Communications
B.S. 1964, Pennsylvania State
University
Donald Joseph Waltman, Jr., Maryland
Electronics
B.S. in E.E. 1965, Virginia Polytechnic
Institute
Henry Keith Whitesel, Maryland
Electronics
B.S. 1963, Antioch College

DOCTOR OF SCIENCE

Wayne James Fischer, Maryland
Networks
Dissertation: *Optimum Random Search Procedures for Detecting Evasive
Targets*
B.S. in E.E. 1961, M.S. in E.E. 1962, Lehigh University
John Oreste Geremia, Maryland
Fluid Mechanics
Dissertation: *An Experimental Investigation of Turbulence Effects at the Solid
Boundary Using Flush Mounted Hot Film Sensors*
B.A. 1958, B.S. 1961, Columbia University
M.S. in Engr. 1964, George Washington University
Douglas Linwood Jones, Virginia
Theoretical and Applied Mechanics
Dissertation: *A Continuum Theory of Dislocations and Dislocation Loops*
B.M.E. 1963, M.S. in Engr. 1965, George Washington University
Jack Kranton, Maryland
Engineering Administration and Systems Science
Dissertation: *Application of Optimal Control Theory to Attitude Control with
Control Moment Gyroscopes (CMGs)*
B.E.E. 1951, City College, New York
M.S. in E.E. 1958, Drexel Institute of Technology
Douglas Edward MacDonald, District of Columbia
Theoretical and Applied Mechanics
Dissertation: *A Lattice Theory for the Strain Energies of Simple Metals for
Isothermal and Isentropic Deformations*
B.E.E. 1965, M.S. in Engr. 1967, George Washington University

SCHOOL OF EDUCATION

Student Marshal: Jane Anne Cirker

BACHELOR OF ARTS IN EDUCATION

Jessica Carter Antkowski, Illinois
History
Jane Anne Cirker, New York
Elementary Education
Anna Kay Hurley, Virginia
Social Studies
Dianne Joan Lerner, Maryland
Elementary Education

Margaret Ann McCourt, Virginia
Elementary Education
Donna May Moyer, Virginia
English
Pamela Hoffman Onyx, Pennsylvania
French

Kathleen Elizabeth Reilly, District of
Columbia
Elementary Education

Patricia Hilliard Robinson, District of
Columbia
Elementary Education
Kathleen Anne Schutzman, Virginia
English

BACHELOR OF SCIENCE IN PHYSICAL EDUCATION

John Dunham Pitzer, Virginia

Glenda Eileen Sweeney, Virginia

MASTER OF ARTS IN EDUCATION

Elaine Paduano Abrams, Maryland
Guidance
B.A. 1953, Columbia Union College
Helen Walker Beals, Virginia
Elementary Administration
B.S. 1952, Boston University
M.A.T. 1967, George Washington
University
Elizabeth Holly Bronz, District of
Columbia
Secondary Education
B.A. 1966, Washington University
Joe Baker Brown, Jr., Maryland
Physical Education
B.A. 1964, Shaw University
Gwendolyn Hall Brunson, District of
Columbia
Elementary Administration
B.S. 1961, District of Columbia
Teachers College
Frankie Mae Caldwell, District of
Columbia
Elementary Administration
B.S. 1945, District of Columbia
Teachers College
Judith Ann Cooke, District of Columbia
Adult Education
B.S. 1961, University of Minnesota
Frederick Eugene Corpening, Delaware
Special Education
B.S. 1963, North Carolina Agricultural
and Technical State University
Lewis Cosmas Daniel Crenshaw,
Maryland
Elementary Administration
B.S. 1947, Coppin State College
B.A. 1956, American University
Paul Esch Duvall, Virginia
Physical Education
B.S. 1955, College of William and
Mary
Richard Joseph Fitzpatrick, Maryland
Secondary Education
B.S. 1964, St. John's University, N.Y.

John Edward Flynn, Maryland
Secondary Administration
B.A. 1965, Washington College
James William Franklin, Maryland
Secondary Administration
B.A. 1966, University of Maryland
Donald Joseph Fugel, Virginia
Secondary Administration
B.S. 1962, District of Columbia
Teachers College
Russell Harold Gordon, Maryland
Special Education
B.S. 1958, Central State College, Ohio
Gloria Wilkerson Greene, District of
Columbia
Curriculum
B.S. 1953, District of Columbia
Teachers College
Charles Ralph Harpole, Maryland
Elementary Administration
B.A. 1950, Grinnell College
Ruth Lenore Hootor, Virginia
Elementary Administration
B.S. 1942, Indiana State University
Herbert Humes, District of Columbia
Elementary Administration
B.S. 1959, Bethune-Cookman College
Johnny Ernest Johnson, Maryland
Guidance
B.S. 1953, Savannah State College
Shirley Winder Jones, District of
Columbia
Elementary Administration
B.S. 1962, Bowie State College
Ronald Walter Kayser, Maryland
Physical Education
B.S. 1964, Shepherd College
Bruce Linn Keith, Virginia
Physical Education
B.S. in P.E. 1968, George Washington
University
Sister Brigid Ann Kelleher, Maryland
Guidance
B.A. 1964, Trinity College, D.C.

- John Bernard Kennedy, Virginia
Adult Education
B.S. in Ae.E. 1960, Boston University
- Doris Simmons Knight, Maryland
Guidance
B.S. 1949, Elizabeth City State College
- Amy Jane Ladley, Virginia
Reading
B.A. in Ed. 1966, George Washington University
- Mary Norquest Lindholm, Virginia
Guidance
B.S. 1963, Madison College
- Gary Ralston Long, Maryland
Guidance
B.A. 1961, B.S. 1962, Ohio State University
- Andrew Burnett Lyles, District of Columbia
Guidance
B.S. 1960, District of Columbia Teachers College
- Edward Alton McClain, Jr., Maryland
Physical Education
B.S. 1962, District of Columbia Teachers College
- William Arthur McKee, Maryland
Secondary Administration
B.S. in Ed. 1966, Indiana University of Pennsylvania
- Marilyn Block Meyers, Maryland
Rehabilitation Counseling
B.A. 1952, Goucher College
- Tony Minus, District of Columbia
Guidance
B.S. 1962, Benedict College
- Marianna Page MacWilliam O'Dwyer, New York
Student Personnel Work in Higher Education
B.A. 1967, George Washington University
- Ethel Mae Parker, District of Columbia
Special Education
B.S. 1947, District of Columbia Teachers College
- William Hoyle Ragsdale, Jr., Maryland
Human Growth and Development
B.A. 1968, George Washington University
- Earl Moody Rector, Sr., Virginia
Elementary Administration
B.S. in Ed. 1965, Youngstown University
- Eleanora Marshall Ridgley, District of Columbia
Elementary Administration
B.S. 1956, District of Columbia Teachers College
- James Cornelius Roane, Maryland
Special Education
B.S. 1966, District of Columbia Teachers College
- Karen Theresa Saur, District of Columbia
Special Education
B.A. 1966, Chestnut Hill College
- Earnest Marlyn Snyder, Virginia
Physical Education
B.A. in Ed. 1955, Glenville State College
- Marcia Elizabeth Thompson, Virginia
Elementary Education
B.A. in Ed. 1962, George Washington University
- Lois Ann Topping, Virginia
Guidance
B.A. 1961, Augustana College, S.D.
- James Edward Vandell, Virginia
Physical Education
B.S. in Ed. 1956, Morris Harvey College
- Larry Lloyd Watson, Maryland
Guidance
B.S. 1965, University of Nebraska at Omaha
- James Russell Wingrove, Maryland
Employee Development
B.S. 1962, California State College, Pa.
- Carl Eugene Zaleski, Virginia
Physical Education
B.S. in P.E. 1959, George Washington University

EDUCATION SPECIALIST

- Louise Berry Bottomley, Maryland
Guidance
B.A. 1954, West Virginia University
Ed.M. 1964, University of Maryland
- Earl Dean Hensley, Maryland
Guidance
B.A. 1961, Lynchburg College
Ed.M. 1965, University of Virginia

Anna Rose Kogel, Virginia
 Special Education
 B.S. 1965, Ohio State University
 M.A. in Ed. 1967, George Washington
 University

Mary Maxine Wagoner, Virginia
 Guidance
 B.S. 1947, Salem College, W.Va.
 M.A. in Ed. 1952, George Washington
 University

DOCTOR OF EDUCATION

- Sylvia Dunnavant Allen, Virginia
 Elementary Administration
 Dissertation: *Expectations for the Virginia Elementary School Teacher: Selected Teaching Ability Requirements as Revealed by Analysis of State and Local Courses of Study*
 B.S. in Ed. 1940, Longwood College
 M.A. in Ed. 1948, George Washington University
- Evelyn Depew Baggs, Virginia
 Teacher Education
 Dissertation: *Training the Teacher of Emotionally Disturbed Children in a Residential Treatment Center*
 B.A. 1940, San Jose State College
 M.A. 1942, University of California, Los Angeles
- Rodney Curtis Bowen, Virginia
 Administration and Supervision
 Dissertation: *An Investigation of the Pre-service Education of Inexperienced Teachers in the Fairfax County, Virginia, School System for the 1967-1968 School Year*
 B.S. in Ed. 1960, California State College, Pa.
 M.A. in Ed. 1963, George Washington University
- James John Decker, Maryland
 Administration and Supervision
 Dissertation: *An Analytic Description of the Neighborhood Youth Corps Program in Prince Georges County, Maryland*
 B.S. in Ed. 1949, Mansfield State College
 M.A. in Ed. 1967, George Washington University
- Daniel Barry Fleming, Jr., Virginia
 Teacher Education
 Dissertation: *A Legislative History of Federally Supported Teacher Institutes in History and Social Sciences*
 B.A. 1953, M.A. 1954, West Virginia University
- John Evers Knipe, Virginia
 Teacher Education
 Dissertation: *A Status Study of Teacher Education in the West Virginia State Colleges—1968*
 B.A. in Ed. 1934, Shepherd College
 M.A. in Ed. 1942, A.P.C. 1965, George Washington University
- John Lobuts, Jr., Maryland
 Secondary Administration
 Dissertation: *A Historical Study of the Establishment and Development of the College of General Studies of The George Washington University*
 B.S. 1957, Fairmont State College
 M.A. in Ed. 1965, George Washington University

Edgar Allen Reeves, Jr., Maryland

Adult Education

Dissertation: *A Comparative Study of Behavioral Styles as Measured by the Job Analysis Interest Measurement (JAIM) of Retired Adult Participation and Nonparticipation in the Institute of Lifetime Learning, Washington, D.C.*

B.S. 1949, University of Wyoming

Ed.M. 1959, Colorado State University

Harold Edward Stuft, Maryland

Administration and Supervision

Dissertation: *The Initial Teaching Alphabet: A Comparison of Its Effectiveness in a Reading Program in Relation to a Program Using Traditional Orthography*

B.S. in Ed. 1954, Towson State College

Ed.M. 1962, University of Maryland

SCHOOL OF GOVERNMENT AND BUSINESS ADMINISTRATION

Student Marshal: Norman Gabriel Oglesby

BACHELOR OF BUSINESS ADMINISTRATION

John West Benton, New Jersey

Business Administration

William Earl Diebner, Maryland

Business Administration

Steven Alan Fine, New Jersey

Business Administration

Thomas Patrick Friese, Virginia

International Business

Gary Charles Granoff, New York

Accounting

Dale Stanley Gustavson, District of

Columbia

Business and Economic Statistics

James Russell Guthrie, New York

Business Administration

John Thomas Hunsucker, California

Business Administration

Albert Andrew Muhlbauer, Jr., Virginia

Accounting

James Emmett Murphy, Virginia

Business Administration

Benard Sharb Pergerson, Jr., Virginia

Business Administration

Mary Joan Schwartz, District of Columbia

Business Administration

Walter Franklin Simon, Maryland

Business Administration

Howard Lee Skinner, Maryland

Business Administration

James Edward Squier, Virginia

Business Administration

James Russell Stoker, Pennsylvania

Accounting

BACHELOR OF SCIENCE IN GENERAL STUDIES

Hugh Sommerville Aitken, Virginia

Business Administration

Donald Lloyd Bagnall, Maryland

Business Administration

Harry Walter Bleh, Ohio

Business Administration

(With Distinction)

Franklin Wood Carter, Missouri

Business Administration

Ernest Clarence Elmore, Minnesota

Business Administration

Charles Arthur Houseman, Jr., Virginia

Business Administration

Henry Chester Langworthy, Jr., Maryland

Business Administration

Charles Perkins Martin, Jr., Virginia

Business Administration

Samuel Byrom Murphey, Virginia

Business Administration

Norman Gabriel Oglesby, Maryland

Business Administration

(With Distinction)

Billy Murray Owen, Virginia

Business Administration

Merril Clyde Pinkepank, Virginia

Business Administration

Gerard Henry Plageman IV, Virginia

Business Administration

Jack Lester Snyder, Indiana

Business Administration

John Russell Tucker, Jr., North Carolina
Business Administration
Joe W Watts, Virginia
Business Administration
Boyce St. Clair Webb, Virginia
Business Administration

David August Wente, Virginia
Business Administration
George Arthur Wickman, Maryland
Business Administration
Richard Stephen Zeisel, Maryland
Business Administration

MASTER OF ARTS IN GOVERNMENT

Barbara Ann Barnett, New York
Public Administration
B.A. 1967, C.W. Post College of
Long Island University
Charles Wayne Clark, Maryland
Public Administration
B.A. 1963, Ohio State University
Gerald Jack Goldman, Virginia
Public Administration
B.A. in Govt. 1953, George Washington
University

Hope Marindin, District of Columbia
Public Administration
B.A. 1948, Swarthmore College
Douglas Presley Scott, Virginia
Public Administration
B.A. 1964, M.Phil. 1969, George
Washington University

MASTER OF BUSINESS ADMINISTRATION

Leavitt Bissell Ahrens, Jr., Connecticut
International Business
B.A. 1965, Yale University
B.F.T. 1966, American Institute for
Foreign Trade
William Reid Anderson, Maryland
Health Care Administration
B.S. in B.A. 1966, West Virginia
University
Philip William Beaumont, Virginia
Business Administration
B.S. 1948, Arizona State University
Joseph Richard Becker, Virginia
Business Administration
B.A. 1955, College of Saint Thomas
Russell LaMonte Bee, Virginia
Business Administration
B.A. 1963, Brigham Young University
James Barry Berg, New Jersey
Health Care Administration
B.A. 1964, Rutgers, the State
University
Joel Richard Berman, Maryland
Business Administration
B.S. 1962, University of Connecticut
John Robertson Birdzell, Indiana
Health Care Administration
B.A. 1961, Wabash College
Melvin Walter Carlton, Jr., Texas
Business Administration
B.S. 1959, Texas A&M University

Robert Stewart Condry, Virginia
Health Care Administration
B.A. 1959, Morris Harvey College
William Felice Cracker, Jr., Virginia
Business Administration
B.E.E. 1964, Villanova University
Richard Steele Davenport, Virginia
International Business
B.S. in E.E. 1966, University of Texas
at Austin
Louis Albert de Bettignies, France
International Business
Diplome de l'Ecole Supérieure de
Commerce et d'Administration des
Enterprises, 1967, Lille, France
Gerald F. Dunaway, Maryland
International Business
B.A. 1968, University of Maryland
John Lee Eidem, Minnesota
Business Administration
B.S. in B.A. 1960, University of North
Dakota
James Medric Eubanks, Virginia
Business Administration
B.S. 1966, University of Maryland
Jon Edward Falck, Maryland
International Business
B.A. 1964, University of Maryland
Neale Roger Goodman, Maryland
Business Administration
B.S. in B.A. 1965, State University of
New York at Buffalo

- Campbell Watkins Gray, Jr., Virginia
Business Administration
B.S. 1952, Virginia Polytechnic
Institute
- Ronald Max Guiberson, Washington
Business Administration
B.A. in B.A. 1961, University of
Washington
- Charles Edward Hardaway, Virginia
Business Administration
B.A. 1955, Ohio Wesleyan University
- Allen Burton Heard, Texas
Business Administration
B.B.A. 1958, University of Texas at
Austin
- Frederick Anderson Huestis, Virginia
International Business
B.A. 1963, Gettysburg College
- Peter Robert Julicher, Maryland
Business Administration
B.B.A. 1966, George Washington
University
- Everett Edward Kavanaugh, Jr.,
Maryland
Business Administration
B.A. 1963, Georgetown University
- Brian Edward Keeley, Florida
Health Care Administration
B.A. 1967, Miami University
- Jackie Don King, Virginia
Business Administration
B.S. 1965, Indiana University
- Fred Stefan Kolm, Maryland
Business Administration
B.S. 1955, University of Nebraska at
Omaha
- Charles Edward Kuebler, New York
Health Care Administration
B.S. 1967, Wagner College
- Homer Preston Leedy, Ohio
Business Administration
B.S. 1964, U.S. Naval Academy
- James Robert Len, Virginia
Business Administration
B.S. 1959, Cornell University
- Brian Charles Lockwood, Arizona
Health Care Administration
B.S. 1963, Arizona State University
- Bernard Leroy Lynch, Jr., Virginia
Business Administration
B.B.A. 1968, George Washington
University
- Francis Xavier Mallgrave, Jr., Maryland
Business Administration
B.A. 1968, University of Maryland
- Kenneth Mateland Manning, Virginia
Business Administration
B.B.A. 1964, George Washington
University
- Joseph William Maurer, Maryland
Business Administration
B.S. in B.A. 1952, Lehigh University
- George Gilfoil McGuire, Maryland
Business Administration
B.A. 1963, University of Notre Dame
- Michael Thomason McRee, Mississippi
Business Administration
B.S. in E.E. 1966, University of
Mississippi
- James Harold Morey, New York
Health Care Administration
B.A. 1967, Saint Lawrence University
- Grant Edward Morris, Jr., District of
Columbia
Business Administration
B.A. 1968, George Washington
University
- Roy William Muth, Virginia
Business Administration
B.S. 1954, U.S. Military Academy
- Richard Dennis O'Keefe, Virginia
Business Administration
B.S. 1960, U.S. Air Force Academy
- Sister Marie-Therese Perdriault,
Massachusetts
Health Care Administration
B.S. in Nursing 1967, Catholic
University of America
- James Francis Phalen, Maryland
Health Care Administration
B.A. 1967, Saint Michael's College
- Ross Alden Powell, Washington
Business Administration
B.A. in Ed. 1960, Central Washington
State College
- Richard Clay Purvis, Virginia
Business Administration
B.B.A. 1966, George Washington
University
- Rene Manuel Ramos, Virginia
Accounting
Certified Public Accountant 1946,
University of Havana, Cuba
- Ronald Ray Rees, Georgia
Health Care Administration
B.S. 1967, Columbia Union College
- Richard Dennis Rose, Maryland
Business Administration
B.S. 1964, Bradley University

- Thomas Albert Rota, Maryland
Business Administration
B.B.A. 1968, George Washington University
- Arthur Rothman, New Jersey
Business Administration
B.S. 1961, Monmouth College, N.J.
- Richard Adrian Scholtes, Maryland
Business Administration
B.S. 1957, U.S. Military Academy
- James Victor Sheldon, California
International Business
B.S. in F.S. 1962, Georgetown University
- Lawrence Edward Shinnick, District of Columbia
Business Administration
B.S. in M.E. 1962, Carnegie-Mellon University
- LL.B. 1965, University of Notre Dame
- LL.M. 1967, George Washington University
- Ann Lacy Shockley, District of Columbia
Business Administration
B.A. 1968, Hollins College
- Eugene Earl Snyder, Virginia
Business Administration
B.A. 1958, University of Rochester
- James Howard Sood, Maryland
International Business
B.S. (Physics) 1954, College of William and Mary
- B.S. (Gen.Engr.) 1954, University of Illinois
- Hubert Harris Sowers, Jr., Maryland
Health Care Administration
B.B.A. 1968, University of Hawaii
- Jerry Wayne Spencer, North Carolina
Business Administration
B.Gen.Ed. 1966, University of Nebraska at Omaha
- Alan Jerome Sprintz, Pennsylvania
Health Care Administration
B.S. 1963, Pennsylvania State University
- Robert John Tice, Virginia
Business Administration
B.S. 1964, St. Francis College, Pa.
- Verlon Kenneth Vrana, Virginia
Personnel Administration
B.B.A. 1967, George Washington University
- Ralph John Waite III, Virginia
Health Care Administration
B.S. in B.A. 1967, Northeastern University
- Paul Frederick Wallner, Virginia
Personnel Administration
B.A. 1962, University of Montana
- Joseph Donald Warren, Jr., Maryland
Business Administration
B.B.A. 1963, Lamar State College of Technology
- Dave Henry Watts, Virginia
Business Administration
B.B.A. 1968, George Washington University
- David Frank Whealdon, Ohio
Business Administration
B.A. 1956, Miami University
- Gary LeRoy Whitaker, New Mexico
Business Administration
B.A. 1958, Eastern New Mexico University

MASTER OF PUBLIC ADMINISTRATION

- Michael Correra, Maryland
Public Administration
B.S. in C.E. 1953, University of Rhode Island

MASTER OF SCIENCE IN ADMINISTRATION

- Snowden Cameron Ager, Maryland
Management Science—Operations Research
B.S. 1954, U.S. Naval Academy
- Joseph Baer, Jr., California
Systems Management
B.S. 1946, U.S. Naval Academy
- William Harry Baker, Virginia
Business Management
B.S. in Gen.Std. 1968, George Washington University
- Norman Lee Beal, Virginia
Management Engineering
B.S. in Ind.Mgt. 1963, University of Akron

- Carl Truman Bell, District of Columbia
Management Science—Operations
Research
B.A. 1961, University of Illinois
- Joseph Francis Bellocchi, Virginia
Industrial Personnel Management
B.S. 1961, University of Nebraska at
Omaha
- Norman Roy Blinn, Maryland
Business Management
B.S. 1962, Lewis College
- Floyd Davis Bowdey, Virginia
Systems Management
B.S. 1946, U.S. Naval Academy
B.S. in Aerology 1953, U.S. Naval
Postgraduate School
- William Grant Boyer, District of
Columbia
International Commerce
B.A. 1967, George Washington
University
- Richard Tennyson Bright II, Virginia
Management Engineering
B.S. 1966, Virginia Polytechnic
Institute
- Donald Lawrence Caskey, Virginia
Industrial Personnel Management
B.B.A. 1951, University of Mississippi
- James Pagaud Coleman, Virginia
Automatic Data Processing
B.S. 1939, U.S. Naval Academy
- Reuel Warren Curtis, Virginia
Systems Management
B.S. in Bus.&Engr.Adm. 1948,
Massachusetts Institute of Technology
J.D. 1957, Georgetown University
- John Richard Dunham, Jr., Virginia
Management Engineering
B.Gen.Ed. 1965, University of
Nebraska at Omaha
- Thomas Michael Dykers, Jr., Virginia
Systems Management
B.S. 1952, U.S. Naval Academy
- James Thomas Ewell, Jr., Virginia
Automatic Data Processing
B.S. 1935, Virginia Polytechnic
Institute
- Robert Wayne Feldhousen, Virginia
Management Engineering
B.S. in C.E. 1959, University of
Nebraska
- Edward Francis Flaherty, District of
Columbia
Business Financial Management
B.A. 1967, University of Wyoming
- Dennis Emanuel Fuller, Virginia
Management Engineering
B.Ae. 1959, Auburn University
- Joseph Clement Gallo, Pennsylvania
Automatic Data Processing
B.S. in Econ. 1966, Villanova
University
- William Evan Gildow, Virginia
Management Engineering
B.A. 1966, George Washington
University
- Kenneth Edward Godfrey, Virginia
Management Engineering
B.S. 1958, Virginia Military Institute
- Robert Franklin Gower, Virginia
Automatic Data Processing
B.S. 1946, U.S. Naval Academy
M.A. 1963, George Washington
University
- Robert Arthur Hackett, Virginia
Industrial Personnel Management
B.S. 1951, U.S. Merchant Marine
Academy
- Gerry Wayne Hall, Georgia
Business Management
B.S. in Ind.Mgt. 1967, Georgia Institute
of Technology
- Larry Maurice Hewin, Virginia
Management Engineering
B.M.E. 1948, Clemson University
- Betty June Hill, Virginia
Automatic Data Processing
B.S. 1967, University of Maryland
- Donald Walter Horner, Virginia
Management Engineering
B.A. 1953, St. Mary's Seminary and
University
B.S. in Humanities and Engineering
1962, Massachusetts Institute of
Technology
- Douglas Donald Innes, Virginia
Automatic Data Processing
B.S. 1959, Cornell University
- Paul Fletcher Jackson, Virginia
Automatic Data Processing
B.Ind.Mgt. 1958, Auburn University
- Robert Joseph Kennedy, Maryland
Public Financial Management
and Budgeting
B.S. 1960, U.S. Naval Academy
B.C.E. 1962, Rensselaer Polytechnic
Institute
- Stephen Albert Korfonta, Virginia
Systems Management
B.S. (S.S.) 1951, Georgetown
University

- Edward Lawrence Kunz, Maryland
Automatic Data Processing
B.S. 1966, University of Rochester
- Edward Douglas Line, Virginia
Automatic Data Processing
B.A. 1957, Washington and Lee
University
- Thomas Leon Lord, Virginia
Management Engineering
B.S. 1957, Pennsylvania State
University
- Carl Jarrett Lowe, Virginia
Systems Management
B.S. 1965, Stillman College
- William Garcia Lundy, Florida
Management Engineering
B.S. 1960, University of Maryland
- Clayton Paschal Mays, Maryland
Systems Management
B.S. 1953, U.S. Naval Academy
- Billy Eugene McCabe, Virginia
Management Engineering
B.S. 1953, Oklahoma State University
- Francis Dennis McCusker, Virginia
Automatic Data Processing
B.A. 1967, George Washington
University
- Joseph Clarence Minnix, Virginia
Automatic Data Processing
B.S. 1964, University of Maryland
- Richard LeRoy Moe, Maryland
Public Personnel Management
B.S. in P.A. 1957, University of
Arizona
- John Francis Newman, Illinois
Systems Management
B.A. 1950, DePaul University
- Charles Lawrence Nowalk, Virginia
Industrial Personnel Management
B.Gen.Ed. 1962, University of
Nebraska at Omaha
- Howard Whitfield Poxon, Jr., New Jersey
Automatic Data Processing
B.S. in E.E. 1959, U.S. Naval Academy
- Bernard Anton Renois, Virginia
Automatic Data Processing
B.E.E. 1962, City College, New York
- Carlo John Roma, Virginia
Management Engineering
B.M.E. 1951, Syracuse University
- Benjamin Franklin Ross III, Virginia
Management Engineering
B.S. 1963, U.S. Naval Academy
- Joseph Clyde Roy, Jr., Virginia
Management Engineering
B.S. in Bldg.Const. 1963, Georgia
Institute of Technology
- Aano Albert Soobert, Virginia
Automatic Data Processing
B.S. 1963, Drexel Institute of
Technology
- Kenneth Fennimore Strickland, Jr.,
Virginia
Industrial Personnel Management
B.S. 1953, Long Island University
- Jesse Monroe Strong, Jr., Virginia
Management Science—Operations
Research
B.S. 1968, University of Maryland
- Raymond Harlan Struble, Virginia
Automatic Data Processing
B.A. 1947, University of Minnesota
- Harry Allen Switzer, Virginia
Management Engineering
B.A. 1963, West Virginia Wesleyan
College
- Richard Hugh Turner, Colorado
Management Engineering
B.S. 1965, Colorado State University
- Ronald Roy Turner, Virginia
Management Engineering
B.S. 1964, Virginia Polytechnic
Institute
- Edward Arthur Uttridge, Virginia
Management Engineering
B.Nuclear Engr. 1965, State University
of New York, Maritime College
- Ronald Reginald Van Stockum, Kentucky
Industrial Personnel Management
B.A. in Econ.&Bus. 1937, University
of Washington
- Michael Paul Vogt, Virginia
Automatic Data Processing
B.S. in Com. 1951, St. Louis
University
- James Dennis Wagner, Virginia
Automatic Data Processing
B.S. in Econ. 1962, University of
Pennsylvania
- John Key Walker, Jr., Virginia
Management Engineering
B.S. 1941, Virginia Polytechnic
Institute
- Charles Vernon Woerner, Virginia
Management Engineering
B.S. 1960, Virginia Polytechnic
Institute

Neal Ray Wooden, Virginia
Automatic Data Processing
B.S. 1960, U.S. Naval Postgraduate
School

Rodney Lee Wright, Michigan
Automatic Data Processing
B.S. 1962, Western Michigan
University

MASTER OF SCIENCE IN BUSINESS ADMINISTRATION

William Francis Coogan, Virginia
B.S. in B.A. 1954, American University
John Winston Gifford, Illinois
B.S. in I.E. 1964, North Carolina State
University at Raleigh
Robert Francis Greene, Massachusetts
B.S. in I.E. 1960, Northeastern
University
Cyrus Samuel Grimshaw, Jr., Virginia
B.S. in Engr. 1954, Georgia Institute
of Technology

Robert Jean Haskell, Virginia
B.S. 1962, University of Maryland
Bobby Lewis Pugh, Maryland
B.S. in B.A. 1956, University of North
Carolina at Chapel Hill
Robert Edward Schmaltz, Virginia
B.S. 1948, Lehigh University
Harrell Kerlin Travis, Virginia
B.Gen.Ed. 1964, University of
Nebraska at Omaha

MASTER OF SCIENCE IN FINANCIAL MANAGEMENT

Dewey Richard Barker, Maryland
B.S. in M.E. 1963, Purdue University
Charles Floyd Bigsby, Idaho
B.S. in Ed. 1961, University of Idaho
Lawrence Adrien Bollinger, Maryland
B.S. in M.E. 1960, University of
Missouri
Gerald Jones Carver, Virginia
B.S. 1957, Memphis State University
Daniel William Costello, Maryland
B.S. 1967, University of Maryland
Robert Alan Dickey, Maryland
B.S. in B.A. 1938, Ohio State University
Richard Abbott Gudgen, Kansas
B.S. in B.A. 1964, Kansas State College
of Pittsburg
Harold Edward Johnson, Virginia
B.S. 1958, Syracuse University
Robert Lee McFarland, Maryland
B.A. 1956, Westminster College, Pa.

Edward Neil Scheinfeldt, District of
Columbia
B.A. 1965, Western Maryland College
Walter Egon Schwartz, Virginia
B.B.A. 1954, City College, New York
Lowell Kalb Solt, Virginia
B.S. in B.A. 1943, Ohio State University
Richard Cabell Tuck, District of
Columbia
B.S. 1946, U.S. Military Academy
Robert Lake Turnage, Mississippi
B.S. 1952, U.S. Naval Academy
B.S. in E.E. 1958, U.S. Naval
Postgraduate School
Richard Vincent, Maryland
B.B.A. 1967, George Washington
University
Jerome Arthur Wolf, Virginia
B.B.A. 1965, M.A. in Econ. 1968,
University of Notre Dame

MASTER OF SCIENCE IN GOVERNMENTAL ADMINISTRATION

Melvin Robert Bielawski, Virginia
B.B.A. 1956, University of Toledo
Robert Thomas Carty, Pennsylvania
B.Gen.Ed. 1959, University of
Nebraska at Omaha
Ray Neil Dearborn, Maryland
B.S. 1961, University of Maryland
Robin Richard Heim, Maryland
B.A. 1964, North Central College
Charles Norman Krueger, Maryland
B.A. 1963, Johns Hopkins University

Roger Frederick Meade, Maryland
B.M.E. 1961, George Washington
University
John O'Donnell, Virginia
Bachelor of Applied Arts 1951,
University of Pennsylvania
William Clement Sullivan, Jr., Maryland
B.A. 1965, University of Maryland
Fred Thomas Teal, Jr., Maryland
B.A. 1957, University of Maryland
Walter Twardowski, Maryland
B.A. 1957, Alliance College

MASTER OF SCIENCE IN PERSONNEL ADMINISTRATION

- Robert Leon Adams, Virginia
B.S. 1954, U.S. Military Academy
- Richard Clarence Barbel, Illinois
B.S. 1956, University of Illinois
- Charles Baumeister, Virginia
B.S. in Gen.Std. 1967, George Washington University
- Homer Earle Beaver, Virginia
B.Gen.Ed. 1964, University of Nebraska at Omaha
- Gordon Thomas Bedford, Maryland
B.S.E. 1939, University of Michigan
- Bobby Joe Berry, Texas
B.B.A. 1953, North Texas State University
- James Lee Coffman, Maryland
B.S. 1948, West Virginia University
- Patrick Wayne Cummings, Virginia
B.S. 1960, Virginia Polytechnic Institute
- James Myron Davis, Washington
B.A. 1966, Seattle University
- Thomas William Donovan, Virginia
B.Gen.Ed. 1965, University of Nebraska at Omaha
- Earl Thomas Elstner, Pennsylvania
B.A. 1966, Park College
- Francis Roland Gauvin, Virginia
B.A. 1962, University of Maryland
- Bernice Halfon, Maryland
B.S. in B.A. 1964, University of Colorado
- Walter Whitaker Honour, Florida
B.S. 1943, U.S. Naval Academy
- Janet Ann Keys, Florida
B.A. 1953, Ohio University
- Emmett Jay Knapp, Virginia
B.S. 1959, U.S. Naval Academy
M.S. in Mgt. 1969, U.S. Naval Postgraduate School
- John LeCornu, Tennessee
B.S. 1961, U.S. Naval Academy
- Christian Michael Lohner, Virginia
B.S. 1954, Providence College
- Gerald Marburg, Maryland
B.A. 1955, City College, New York
- Edward Ellwood Mellott, Maryland
B.E.S. 1963, Johns Hopkins University
- Herbert Wills Oglesby, Virginia
B.A. in Govt. 1951, George Washington University
- Richard Albert Sheftel, Maine
B.S. in Ed. 1953, City College, New York
- Henry William Steel, Maryland
B.S. in E.E. 1958, Lafayette College
- Jerry Lee Taylor, Maryland
B.A. 1955, Le Moyne College
- John Hollis TenBrook, Maryland
B.S. 1964, U.S. Naval Academy
- Joe Dennard Thigpen III, Florida
B.A. 1966, University of Florida
- Doris Ruth Vail, Virginia
B.A. 1958, University of Denver
- Milton Frank Valenta, Maryland
B.S. in E.E. 1948, Iowa State University of Science and Technology
- B.S. 1962, Johns Hopkins University
- Anthony Walker, Virginia
B.A. 1939, Yale University
- Forest Elson Walker, Virginia
B.S. 1960, Virginia Polytechnic Institute
- John Witherspoon, Virginia
B.S. 1949, Davidson College
- Louis Joseph Zeleznikar, Virginia
B.S. in Mgt. 1953, University of Illinois

CERTIFICATE IN HEALTH CARE ADMINISTRATION

- Virgil Gaines Tudor, Maryland
B.S. 1946, Eastern Kentucky University
M.P.H. 1959, Tulane University of Louisiana

DOCTOR OF BUSINESS ADMINISTRATION

- Fred Richard Bahr, Virginia
Dissertation: *The Expanding Role of the Department of Defense as an Instrument of Social Change*
B.A. 1962, M.A. 1963, George Washington University

- Harry Dewey Baker, Jr., Maryland
 Dissertation: *The Effectiveness of Company-sponsored Educational Programs for Nonsupervisory Exempt Employees*
 B.S. in E.E. 1958, University of Pittsburgh
 M.E.A. 1964, George Washington University
- Charles William Getz, Texas
 Dissertation: *An Analysis of Management of the Data Resource*
 B.A. 1952, University of Albuquerque
 M.Litt. 1955, University of Pittsburgh
- Alfred Rozier Rector, Maryland
 Dissertation: *The Compatibility between the Inheritance Tax Law and the Property Law in the District of Columbia*
 J.D. 1952, American University
 B.A. in Govt. 1955, LL.M. 1958, George Washington University
- Philip Norman Reeves, Virginia
 Dissertation: *A Study of Adoption of Electronic Data Processing in the Hospital Industry*
 M.B.A. 1959, University of Chicago

SCHOOL OF PUBLIC AND INTERNATIONAL AFFAIRS

Student Marshal: Stephen Richard Wessel

BACHELOR OF ARTS

- | | |
|------------------------------------|--|
| Richard Clark Church, Virginia | Moses Lewis Perry, Jr., District of Columbia |
| International Affairs | International Affairs |
| David Lester Finley, Virginia | John Frank Post IV, Connecticut |
| International Affairs | International Affairs |
| Thomas Alan Lankard, Virginia | Alexa Lee Sieman, Virginia |
| International Affairs | International Affairs |
| Fay Lebowitz, District of Columbia | Stephen Richard Wessel, Virginia |
| International Affairs | International Affairs |
| | (With Distinction) |

MASTER OF ARTS

- | | |
|--|--|
| Bennie Edward Bough, Virginia | Wayne Edward Long, Louisiana |
| International Affairs | International Affairs |
| B.A. 1964, U.S. Naval Postgraduate School | B.A. 1966, Centenary College |
| George Carner, District of Columbia | Iva Jo McKinney, Virginia |
| International Affairs | International Affairs |
| B.A. 1965, University of North Carolina at Chapel Hill | B.A. 1959, University of Denver |
| Leo Marshall Cyr, Virginia | Anna Smith Payne, District of Columbia |
| International Affairs | International Affairs |
| B.A. 1967, Ohio University | B.A. 1963, LaGrange College |
| Robert Thomas Dickman, Ohio | Ilda Frances Procopio, Missouri |
| International Affairs | International Affairs |
| B.J. 1964, University of Missouri | B.A. 1968, Mount Holyoke College |
| John Edward Folds, Virginia | Susan Berwind Schiffer, Pennsylvania |
| International Affairs | International Affairs |
| B.A. 1964, Stetson University | B.A. 1967, Wheaton College, Mass. |
| Robert Riley Kyser II, Maryland | Ivo Joseph Spalatin, Virginia |
| International Affairs | International Affairs |
| B.A. 1968, Graceland College | B.S. 1967, Marquette University |

MASTER OF SCIENCE IN INTERNATIONAL AFFAIRS

Richard Stockton Cumming III, New York
 B.S. 1954, Oglethorpe University
 Frank Clayton Gilmore, California
 B.S. 1952, Utah State University of Agriculture and Applied Science
 Edwin Charles Kisiel, Virginia
 B.S. 1941, U.S. Military Academy
 Robert Joshua Koch, Louisiana
 B.S. 1947, U.S. Military Academy
 Jasper Lockwood Olmstead, Virginia
 B.A. 1943, Brown University

Marion Collier Ross, New York
 B.S. 1949, U.S. Military Academy
 Leo Eugene Soucek, Virginia
 B.S. 1949, Virginia Military Institute
 M.Engr. (C.E.) 1957, Texas A&M University
 Compton Eugene Ward, Rhode Island
 B.S. 1956, U.S. Naval Academy
 M.S. in Meteorology 1963, U.S. Naval Postgraduate School
 Richard Harmon Wilson, Maryland
 B.S. 1945, U.S. Naval Academy

Annual Commencement, May 31 and June 7, 1970

COLUMBIAN COLLEGE OF ARTS AND SCIENCES

ASSOCIATE IN ARTS

Cathleen Marie Bahan, Maryland

Helen Elizabeth Hardesty, District of Columbia

BACHELOR OF ARTS

Steven Louis Ableman, Delaware
 Political Science
 Harvey Bruce Abrams, District of Columbia
 Speech Pathology and Audiology
 Cheryl Denise Adams, District of Columbia
 Spanish Language and Literature
 Martha June Adcock, District of Columbia
 Psychology
 Marc Elliott Albert, Pennsylvania
 History
 Chris Dominic Aldridge, Indiana
 Political Science
 Donna Joy Alelyunas, New Jersey
 Political Science
 John Scott Alexander, Virginia
 Sociology
 Elizabeth Holbrook Alley, Connecticut
 Art History and Theory
 Nancy Altfeder, New York
 Art History and Theory
 Susan Ann Altfilish, Maryland
 Dramatic Art

Sandra Altman, South Carolina
 Psychology
 Steven Michael Anastasion, Connecticut
 Economics
 Cathleen Ellen Apgar, Maryland
 American Literature
 Diane P. Apostolos, New Jersey
 Religion (Special Honors)
 Dennis Wayne Arrow, District of Columbia
 Political Science
 Frances Patricia Aschheim, New York
 Psychology
 Mary Malone Atlee, Pennsylvania
 American Literature
 Doris Winifred Babb, Georgia
 Psychology (Special Honors)
 Stephen Lawrence Bachmann, Massachusetts
 History
 Linnea Eleanor Back, District of Columbia
 Psychology
 Lisa Pryor Baker, District of Columbia
 Art History and Theory

- Anna Berniece Ballard, California
English Literature
- Laurie Rose Baral, New Jersey
History
- Maria Susana Barros, Maryland
Anthropology
- Janet Jacobs Barch, District of Columbia
Dramatic Art
- John Kevin Baska, California
Zoology
- George Thomas Beall, Virginia
Psychology (With Distinction)
- Judith Anne Beane, Massachusetts
Spanish Language and Literature
- Gloria Charles Menzel Becker, Maryland
Psychology
- Ava Maria Belohlav, New Jersey
Germanic Languages and Literatures
- Elliott Martin Benay, District of Columbia
Sociology
- Robert Stephen Bennett, Louisiana
Political Science
- Peter Lee Bensen, District of Columbia
Psychology
- Deborah Norris Bent, Pennsylvania
History
- Fredric Robert Berg, New York
Dramatic Art
- Carol Linda Berkelhammer, Pennsylvania
Political Science
- David Lawrence Berkman, Connecticut
Psychology
- Jerome Philip Berkowitz, New Jersey
Psychology
- Andrew Michael Berman, Delaware
Sociology
- Margaret Anne Berman, Indiana
History
- Richard Lewis Bernknopf, Connecticut
Economics
- David Richard Berz, Illinois
Religion (Special Honors)
- Rosemary Elaine Patton Besenyei, Maryland
Fine Arts
- Michael Aaron Bienstock, New York
Psychology
- Marc Meyers Bilder, Pennsylvania
Political Science
- Herbert Lester Bilsky, Illinois
Philosophy
- George Vincent Biondi, Georgia
Philosophy
- Alice Theresa Bliss, Virginia
Speech Pathology and Audiology
- Bennett David Block, Pennsylvania
Political Science
- Nancy Dee Bloomgarden, New Jersey
Psychology
- Ronald Scott Bluestone, New York
Anthropology
- Penny Lea Blum, District of Columbia
Political Science
- Mark Herbert Bluver, New York
Political Science
- Hélène Bobritzky, New York
Art History and Theory
- Deborah Anne Boggs, New York
History
- Leighton Teeterick Bohl III, Virginia
English Literature
- Charles Aldridge Boone, Virginia
Psychology
- Linda Cherr Bowers, New Jersey
English Literature
- Susan Charlotte Bowman, District of Columbia
Sociology
- Christine Cleo Bradley, Illinois
Anthropology
- Molly Virginia Shepard Brady, District of Columbia
Economics (With Distinction)
- Carmel Ann Brennan, District of Columbia
Fine Arts
- Anne Lee Brewer, Massachusetts
French Language and Literature
- Carole Linda Brill, New York
American Civilization
- John Robert Broadway, Jr., Alabama
History
- Jean Brodsky, Illinois
American Civilization
- Warren Lewis Broughton, Maryland
Medicine
- Janice Pamela Brown, New York
Political Science
- Lynda Lee Browning, New Jersey
Political Science
- Marcia Ellen Brubeck, District of Columbia
Germanic Languages and Literatures
- William Edward Bucknam, Virginia
English Literature
- Marvin Arthur Budoff, New York
Physics (Special Honors)
- Mary Helen Burgess, District of Columbia
Anthropology
- Scott Edward Burgess, New York
Zoology

- Roger William Burke, Jr., District of
Columbia
History
- Harry Burnett III, Virginia
English Literature
- Carroll Ann Burns, Maryland
Psychology
- Bonnie Barit Callahan, Virginia
Sociology
- Betty Jane Capelluto, New York
French Language and Literature
- Martha Marie Cappelletti, Virginia
Anthropology
- Arlene Phyllis Carey, District of
Columbia
American Literature
- Thomasina Cason, District of Columbia
Psychology
- Barbara Rosenthal Casper, Jr.,
Pennsylvania
Political Science
- Linda Carol Caul, Ohio
Economics
- Arthur Myles Cavanagh, Jr., Virginia
Political Science
- William Edward Caves, Maryland
Physics
- Shanti Chacko, New York
Sociology
- Bruce Chait, New Jersey
Political Science
- Judith Catherine Chamberlain, New
Jersey
Latin
- Neil Joseph Chamberlain, Maryland
History
- Doris Esther Chappnick, Virginia
Journalism
- Meredith Ann Ciesla, Rhode Island
English Literature
- Andrea Appel Cincotta, Maryland
History
- Lesley Kane Clark, Virginia
Political Science
- Malinda Jane Clark, Virginia
Sociology
- Robert Burton Clark, Kansas
Psychology
- Richmond Wharton Coburn, Missouri
Political Science
- Thomas Preston Cochran III,
Pennsylvania
Psychology
- Joel Mark Cockrell, Maryland
Political Science
- Joanne Cocolis, District of Columbia
Sociology
- Jonathan Frederic Cohanne, Pennsylvania
Political Science
- Candace Rebecca Cohen, Kansas
Political Science
- Jean Kobey Cohen, New York
American Literature
- Judith Gail Colton, District of Columbia
Political Science
- James Joseph Connolly, Maryland
History
- Elizabeth Leah Conroy, Virginia
History
- Andrew Bruce Consovoy, New Jersey
Sociology
- Christine Erika Cooper, District of
Columbia
French Language and Literature
- Sheryl Jean Corcoran, Florida
Psychology
- David Richard Coughlin, District of
Columbia
History
- Bruce Elliott Covill, New Hampshire
Journalism
- John James Cowan, Maryland
Physics (With Distinction)
- Carrie West Crosson, Maryland
Fine Arts
- Monica Murphy Cummings, Florida
Philosophy
- Susan Ruth Dankoff, New York
Psychology
- Howard Michael Davis, Maryland
Anthropology
- Elizabeth Bradford Davison, District of
Columbia
Economics
- Neil De Haan, Jr., New Jersey
History (With Distinction)
- Mary Winfield Delaney, New York
Political Science
- John Thomas Del Negro, Massachusetts
Political Science (With Distinction)
- Ellen Claire Demel, New Jersey
Art History and Theory
- Merrill Ann Deming, California
Political Science
- Suzette Derzavis, District of Columbia
Art History and Theory
- Noreen Elizabeth Dewaal, District of
Columbia
French Language and Literature
- Gay Edelen Dicus, Virginia
Anthropology
- Abigail Gibbs Dodge, Connecticut
Anthropology

- Nathaniel Lee Doliner, Florida
Political Science
- John Joseph Doyle, Pennsylvania
Journalism
- Mitchell Scott Draizin, New York
Political Science
- Louise Mary Drake, Ohio
Sociology
- Cornelius Stephen Driscoll, District of
Columbia
Political Science
- William Francis Duane, District of
Columbia
Psychology
- Janet Louise Dubin, Pennsylvania
Sociology
- William Scandrett Dubin, Connecticut
Sociology
- Charles Richard Duda, Pennsylvania
Geography
- Lawrence Alan Dunkelman, New York
English Literature
- Nancy Townsend Dunlop, Texas
Journalism
- Stephen Thomas Earls, Massachusetts
Medicine
- Marian Edelman, Maryland
Political Science
- Randy Mike Edwards, Indiana
Philosophy
- Barry Jay Efros, New Jersey
Zoology (With Distinction)
- Julius Elliot Eittington, Maryland
Psychology
- Karen Jeanne Elkins, California
Russian Language and Literature
- Helen Louise Ellice, Connecticut
History
- Susan Ellis, Virginia
Art History and Theory
- Sally Bradley Elsey, District of Columbia
Psychology
- Jerome Milton Eloff, District of
Columbia
Psychology
- Karen Anne Engstrom, District of
Columbia
Anthropology
- Marguerite Lamont Ephraim, Maryland
Psychology
- Nancy Ellen Epstein, Missouri
Art History and Theory
- Richard Gary Epstein, New Jersey
Physics (With Distinction,
Special Honors)
B.A. 1970, George Washington
University
- Vivian Erani, New York
Sociology
- David Jeffrey Erlichman, Maryland
History
- Michael Ray Ester, California
Anthropology (Special Honors)
- Wendy Elizabeth Evans, New York
Political Science
- Edward Sherwood Fader, Virginia
American Literature
- Bonnye Leslie Fainberg, Maryland
Psychology
- Patricia Ruth Fairbairn, New York
English Literature
- Ronni Merrill Faust, Pennsylvania
Dramatic Art
- Naomi Miriam Feldman, Connecticut
Psychology
- Robin Dee Feldman, New Jersey
Journalism
- Wendy Ilene Feldman, Ohio
Art History and Theory
- Adelfa Gilda Fernandez, Maryland
Spanish Language and Literature
(With Distinction, Special Honors)
- Thomas Anthony Ferraro, Massachusetts
Political Science
- Kay Alicyn Ferrell, New Jersey
Russian Language and Literature
- Mary Alexandra Ferris, West Virginia
Sociology
- Susan Terri Fields, New Jersey
Speech Pathology and Audiology
- Eleanor Charlton Fisher, District of
Columbia
English Literature
- Carol Reisen Flanagan, District of
Columbia
English Literature (Special Honors)
- Monica Faye Fleischmann, Virginia
Psychology (Special Honors)
- Patricia Glynn Foley, Virginia
English Literature
- Elizabeth Netburn Fox, Maryland
American Civilization
(Special Honors)
- Catherine France, Maryland
Fine Arts
- Mary Anne Bassett Frey, Maryland
Physics (With Distinction)
- Jeri Helene Friedman, New York
Psychology
- Priscilla Anne Fuhrken, Virginia
History
- Georgette Eileen Furey, District of
Columbia
English Literature

- Elaine Edwards Gaitskill, Virginia
 Art History and Theory
 Duane LeRoy Charles Galles, Minnesota
 History
 Nicole Suzanne Gallet de Saint Aurin,
 Florida
 French Language and Literature
 William Henry Galligan, Jr., Connecticut
 American Literature
 Elaine Margaret Gallina, New York
 American Literature
 Peter Charles Gamache, Maine
 Political Science
 Gabrielle Joan Garrison, Maryland
 Psychology
 Daniel Garson, Maryland
 American Civilization
 Maureen Elizabeth Gearty, District of
 Columbia
 English Literature
 Norman B. Gelbart, Maryland
 Applied Statistics (Special Honors)
 Alan Jay Gelfand, New Jersey
 Political Science
 Steven Michael Gelobter, New York
 Political Science
 Stuart Scott Genser, Virginia
 Psychology
 Susan Correen Gentz, Virginia
 Economics
 Nancy Caplan Gersh, Virginia
 Psychology
 James Morris Gerson, Massachusetts
 Political Science
 Sheldon Barry Gewirtz, Rhode Island
 English Literature
 Francis Thomas Gieringer, Maine
 Political Science
 Arnold Joel Gildenhorn, Maryland
 Psychology
 Frank Longan Gillespie, Virginia
 Anthropology
 Terence Albert Gilmore, District of
 Columbia
 Political Science
 Paul Bernard Glass, Pennsylvania
 History
 Terry Robert Glass, New Jersey
 Psychology
 Philip Saul Glickman, New York
 History
 Linda Sue Glisson, Netherlands
 Journalism
 Kenneth Allen Goldberg, Ohio
 Zoology
 Natalie Rose Goldberg, New York
 English Literature
 Robert Stephen Goldblatt, New York
 Zoology
 Barry Stephen Goldman, Massachusetts
 Psychology
 Phyllis Sara Goldman, Massachusetts
 American Civilization
 Frank Gomez, Maryland
 Applied Statistics
 Candace Jill Gordon, Maryland
 Political Science
 Theodore William Graves, Virginia
 Social Sciences
 Eugene Curtis Green, South Carolina
 Geography
 Susan Ruth Green, Virginia
 Speech Pathology and Audiology
 Frank Roger Greenhut, New York
 Economics
 Mark Harris Greenspun, Maryland
 English Literature
 Anne Lynn Griffin, Virginia
 American Literature
 Georgella Griffiths, Virginia
 Psychology
 Judith Grissom, Virginia
 English Literature
 Mark Lawrence Gross, New York
 Philosophy
 Robert Gregory Gross, England
 Economics
 Nancy Rose Groth, Massachusetts
 Economics
 John Julius Guenther, Virginia
 Social Sciences (With Distinction)
 Elizabeth Catherine Gunter, Pennsylvania
 French Language and Literature
 Kim Gutman, New York
 Dramatic Art
 Diane Jordan Haar, New Jersey
 Sociology
 Leslie Carter Hallock, New York
 Anthropology
 Bruce Elliot Hammer, District of
 Columbia
 Psychology
 Gwendoline Roberts Handler, Virginia
 Fine Arts
 Patricia Virginia Haney, Virginia
 Political Science
 Daniel Grant Hankins, Pennsylvania
 Anthropology
 Charles Cameron Hargrove, Virginia
 Psychology
 Katherine Estelle Hartman, Virginia
 English Literature
 Jeffrey Waldo Hartsough, Pennsylvania
 Economics

- Nancy Mary Haskett, Maryland
Fine Arts
- Gretchen Dupuis Hasse, Pennsylvania
Geography
- Gloria Elin Hatrick, Maryland
American Civilization
- Kenneth Bruce Hausman, New Jersey
Psychology
- Timothy George Hayes, Virginia
History (Special Honors)
- Kathleen Marian Heffron, Virginia
English Literature
- Carole Marcia Heilman, District of
Columbia
Psychology
- Rodney Glenn Hemphill, District of
Columbia
Religion
- Leslie Anne Henkel, Illinois
Speech Pathology and Audiology
- Howard Carroll Heron II, Maryland
Zoology (With Distinction)
- Mary Reasoner Herrick, Hawaii
Geography
- Margaret Ann Herron, Virginia
Art History and Theory
- Dabney Jane Hibbert, District of
Columbia
English Literature
- Dolores Vivian Higby, Maryland
Psychology
- Robert Millson Higdon, Virginia
Political Science
- Barbara Sue Hodous, Ohio
Political Science
- Renate Elizabeth Hoinkes, New York
Germanic Languages and Literatures
- Karen Elise Hollander, District of
Columbia
Psychology
- John Kent Hollingsworth, New Jersey
Psychology
- Thomas Bradford Holt, Virginia
American Civilization
- Mitchell Brian Holtzman, Maryland
Psychology
- Adrienne Aileen Honig, New York
Russian Language and Literature
- Alan Leslie Honorof, New York
Political Science
- Doña Claire Hopper, District of Columbia
Fine Arts
- Arnold David Horwitz, Maryland
Psychology
- Donna Helen Humeston, Connecticut
Philosophy
- Malcolm Kimmel Huston, Jr., Virginia
Psychology
- Howard Layne Isaacson, District of
Columbia
History
- Lynn S. Jacobs, Maryland
Psychology
- Brian Paul Jenny, Connecticut
American Civilization
- Barbara Susan Jewler, Maryland
American Literature
(With Distinction)
- Susan Mary Johns, New York
Anthropology
- Margaret Anne Johnson, Virginia
Sociology (With Distinction)
- Paul Easton Jones, Virginia
Philosophy
- Philippe Geyer Jones, Virginia
Political Science
- David James Judd, District of Columbia
American Civilization
- Jonathan Seth Kahan, Florida
History (Special Honors,
Departmental Honors)
- James Gray Kane, Florida
Political Science
- Sheldon Henry Kaplan, Rhode Island
Applied Statistics (Special Honors)
- Barbara Michelle Karesh, South Carolina
Sociology
- BeBe Dorfman Katims, District of
Columbia
Anthropology
- Ellen Carol Katz, Massachusetts
Psychology
- Lorna Sandra Katz, New Jersey
Speech Pathology and Audiology
- Laura Lee Kaufman, Massachusetts
Art History and Theory
- Victor Joseph Kavy, New York
Political Science
- Elyse Kaye, New York
Psychology
- Michael David Kelly, Massachusetts
Economics
- Harold Kenner, Jr., Rhode Island
Dramatic Art (Special Honors)
- Mary-Ann Kettler, Virginia
French Language and Literature
- Sameera Khan, District of Columbia
American Civilization
- Benjamin Francis Kincannon III, Virginia
Economics
- Virginia Lee Kintz, New York
Political Science

- Sharon Haines Kirkpatrick, Maryland
Fine Arts
- Marilyn Kirschner, New York
Sociology
- Linda Greenspan Kirtz, Virginia
Fine Arts (With Distinction)
- Nancy Ruth Kitt, New York
Art History and Theory
- Bruce Wayne Klein, Maryland
Economics
- Mary Elizabeth Kline, District of
Columbia
Speech Pathology and Audiology
- Marisa Isabel Knowlton, District of
Columbia
Art History and Theory
- Christine Kobbe, Kansas
Political Science
- Arlene Faye Koons, Pennsylvania
Speech Pathology and Audiology
- Steven Laurence Kornstein, New York
Anthropology
- Barbara Jean Kosar, Connecticut
Sociology
- Michael Sanders Kotlen, Texas
Journalism
- Nina Susan Kousin, New Jersey
English Literature
- Patti Beth Kramer, Connecticut
Art History and Theory
- Carol Marjorie Krause, California
Political Science
- Lynda Joan Kress, District of Columbia
Dramatic Art
- Kerry Lee Kuhn, New York
Medicine
- Christine Mary Kulick, District of
Columbia
Sociology
- James Minor Kulp, Jr., District of
Columbia
English Literature
- Richard King-Pui Kwok, District of
Columbia
Psychology
- Julia Ann Lake, Virginia
Art History and Theory
- Mary Susan Lally, Virginia
English Literature
- Eric Christopher Landman, New Jersey
Political Science
- Aura Pearsall Lang, District of
Columbia
Fine Arts
- Richard Dennis Lang, District of
Columbia
Fine Arts
- Stephanie Ainsworth Laurén, Maryland
Fine Arts
- Bruce Michael Lawlor, Vermont
Political Science
- Thomas Hardy Leahey, District of
Columbia
Psychology (With Distinction)
- Philip David Lee, England
Art History and Theory
- Barbara Ann Leff, New York
Dramatic Art
- Richard David Legon, New York
Political Science
- Peter Lehrer, New York
Psychology
- Larry Leibowitz, Ohio
History
- Christine Elizabeth LeMaire, New York
Political Science
- Jeffrey Paul Lennard, Massachusetts
Political Science (With Distinction)
- Gary Raymond Leschner, Washington
Political Science
- Raymond David Levine, Massachusetts
Latin American Studies
- Robin Ellen Levine, New Jersey
French Language and Literature
- Mark Howard Levison, Missouri
Sociology
- Evelyn Frances Levsky, Maryland
English Literature
- Mary Ellen Lewis, Virginia
Psychology
- Kathryn Anne Mahoney Lilly, Virginia
English Literature
- Wendy Louise Lipton, Virginia
Sociology
- Richard Alois Litkowski, District of
Columbia
Mathematics (With Distinction)
- Rachelle Litwack, Pennsylvania
History (Special Honors,
Departmental Honors)
- Shirley Ellen Lloyd, District of Columbia
Anthropology
- David Bruce London, Maryland
Chemistry
- Alan Stewart Lowe, Georgia
Political Science
- Patti Lee Lowery, District of Columbia
Psychology
- Leonard Lubart, District of Columbia
Economics
- Donald Edward Lucas, District of
Columbia
Journalism

- Mark Rose Luther, North Dakota
History
- Sandra Jean Luthy, New Jersey
Psychology
- Frances Elizabeth Lux, District of
Columbia
Psychology
- Florine Evelyn Lyons, Maryland
Art History and Theory
- Linda Campbell MacConnell, New Jersey
French Language and Literature
(With Distinction)
- Deborah Ann MacDonald, District of
Columbia
Psychology
- Lynne Anne Mace, Colorado
Religion
- Donna Eileen Mackey, New Jersey
Psychology
- Christina Hartman Macy, New York
Anthropology
- Deborah Lee Maddock, Virginia
Political Science
- Elyse Magun, District of Columbia
Psychology
- Maureen Ann Malloy, Venezuela
Spanish Language and Literature
(Special Honors)
- Philip Dennis Maloney, California
Economics
- Kenneth Allen Manni, Rhode Island
Political Science
- Joan-Ellen Marci, Connecticut
Geography
- Harriet Beth Marcus, Florida
Political Science
- Janet Lynn Marloff, New Jersey
English Literature
- John Edward Martancik, Jr., New Jersey
Political Science
- James Lawrence Mason, Massachusetts
History
- Susan Mastrianni, New York
History
- Mitchell Dale Mastrin, Pennsylvania
Psychology
- Lois Jeanne Maull, Pennsylvania
Speech Pathology and Audiology
- Elizabeth Randall McConahy,
Pennsylvania
American Literature
- Michele Terry McDonald, Pennsylvania
Psychology
- Rita Harriet McMahon, District of
Columbia
Psychology
- Deevon Lorraine Meade, District of
Columbia
American Civilization
- Lucy Laretta Melbourne, Virginia
Germanic Languages and Literatures
- Judith Crommelin Melby, District of
Columbia
French Language and Literature
- Dale Carolyn Meltzer, District of
Columbia
Sociology
- Gail Miriam Meltzer, District of
Columbia
Psychology
- Jessamine Martin Mensing, New Jersey
Sociology
- Richard Carl Meo, Connecticut
French Language and Literature
- Faye Sharon Mervis, Ohio
French Language and Literature
- Martin Louis Meth, New York
Economics
- Deborah Ann Meyer, Florida
Anthropology
- Ellen Louise Meyer, Pennsylvania
Art History and Theory
- Isabel Cristina Meyer, District of
Columbia
Art History and Theory
- Robert Leonard Meyer, Pennsylvania
American Civilization
- Alexis Gardella Michael, District of
Columbia
Anthropology
- Stephen Charles Michael, Illinois
French Language and Literature
- Maren Stuart Michelet, District of
Columbia
History (Special Honors)
- Elizabeth Bean Millemann, Maryland
Psychology
- Elizabeth Ann Miller, Pennsylvania
American Literature
- John Douglas Miller, Massachusetts
Economics
- Leslie Fotheringham Miller, District of
Columbia
Applied Statistics (Special Honors)
- Jane Valentine Minor, New York
Latin American Studies
- Sharon Lee Minor, District of Columbia
Fine Arts
- Julie Mayme Misegades, Virginia
English Literature (Special Honors)

- Deborah Karen Modrak, District of
Columbia
Philosophy (With Distinction,
Special Honors)
- Bruno Mongiardo, District of Columbia
History (With Distinction, Special
Honors, Departmental Honors)
- Dennis Robert Moore, Connecticut
Political Science
- Dorothy Tuell Moore, Virginia
Psychology (Special Honors)
- Billie Jo Moreland, Virginia
Social Sciences
- Gwendolyn Elizabeth Morgan,
Pennsylvania
Sociology
- Helena Holmes Morrison, Virginia
French Language and Literature
(With Distinction)
- Carol Jean Morrow, Virginia
Sociology
- Nancy Baer Moses, Pennsylvania
American Civilization
- Mary Christine Murray, Virginia
Art History and Theory
- Mari Shinri Nakamura, District of
Columbia
English Literature
- Virginia Elizabeth Neale, Maine
Political Science
- John Edmonds Neill, Jr., New York
Sociology
- Theodore Mark Nestor, Connecticut
History
- David Steven Newberger, Illinois
Political Science
- Pamela Brooks Nichols, District of
Columbia
History
- James Thomas Nicholson III, Maryland
Spanish Language and Literature
- Lucy Ann Nitti, New Jersey
Philosophy
- Susan Hunley Noonan, District of
Columbia
Art History and Theory
- Heather Lynn Novy, New Jersey
Speech Pathology and Audiology
- Susan Nowogrodzki, New York
Fine Arts
- Walter Donald Oberlander, New Jersey
Economics
- Evaristus Emeka Ogu, District of
Columbia
Sociology
- Carla Sue O'Neill, Virginia
Psychology
- Thomas Lewis Osborne, Kansas
Political Science
- Rochelle Ann Ostroff, New Jersey
French Language and Literature
- Sanford Roy Oxfeld, New Jersey
Political Science
- Christina Arvidsdotter Pardo, District of
Columbia
French Language and Literature
- Judith Paris, New York
American Civilization
- Margaret Agnes Parr, District of
Columbia
History (With Distinction)
- Robert Foust Peck, Maryland
Social Sciences
- Juan Carlos Diego Penhos, Maryland
Medicine
- Elizabeth Ann Perdue, Virginia
Psychology
- Gerald Vern Perkins, Jr., Iowa
American Civilization
- Sandra Dunton Perkins, Virginia
Fine Arts
- Warren Roger Peterson, Maryland
Social Sciences (With Distinction)
- Nicole Paula Pezzati, District of
Columbia
English Literature
- Charles Shelby Pfuntner, District of
Columbia
Anthropology
- John Francis Pholeric, Jr., Pennsylvania
Chemistry
- Patricia Beth Pogal, New York
Spanish Language and Literature
(With Distinction)
- Lee Butler Pope, District of Columbia
English Literature
- Luke Popovich, District of Columbia
Philosophy
- Alex Theodore Pregel, District of
Columbia
Physics (With Distinction)
- Michael Pressfield, New York
History
- Linda Cheryl Proctor, District of
Columbia
Sociology
- Susan Janet Provisor, New Jersey
Art History and Theory
- Robert J. Rabal, New York
Sociology

- Nechama Rabinowitz, New Jersey
Sociology
- Karen Marie Radius, Illinois
Political Science
- Emily Susan Radler, Connecticut
Psychology
- Michael Azard Rae, Maryland
Russian Language and Literature
- Jan Eden Ralph, Maryland
Speech Pathology and Audiology
- Lucy Barnard Ramee, New York
French Language and Literature
- Bonnie Gail Rapoport, Maryland
American Civilization
- Sheldon Jay Rapoport, Connecticut
History
- Jay Allen Rappaport, New York
History
- Michael Rawson, New York
Political Science
- Donna Jean Reifenrath, New Jersey
Sociology
- Barbara Gina Reisman, Pennsylvania
Art History and Theory
- Gregory James Ricca, District of
Columbia
Political Science
- Nancy Laura Ricca, District of Columbia
Fine Arts
- Carol Ann Riccio, Delaware
Psychology
- Rosemary Rice, Ohio
Psychology (With Distinction)
- Elizabeth Ruth Richardson, District of
Columbia
Fine Arts
- Karen Kuhlthian Roberson, North
Carolina
Political Science
- Margot Ellen Roos, District of Columbia
Anthropology
- Carol Felice Rose, Pennsylvania
History
- Sheila Rose, District of Columbia
Anthropology
- David Michael Roseman, Massachusetts
Political Science (With Distinction)
- Barbara Jean Rosenbaum, Rhode Island
Speech Pathology and Audiology
- Linda Susan Rosenbaum, District of
Columbia
French Language and Literature
- Judith Kay Rosenberg, Maryland
Psychology
- Frank Michael Rosenblatt, Virginia
Germanic Languages and Literatures
- Richard Henry Rosenstock, District of
Columbia
History
- Gail Helene Rosenthal, New Jersey
American Civilization
- Steven Joel Ross, Massachusetts
History (Special Honors,
Departmental Honors)
- Richard David Roth, District of Columbia
Psychology (Special Honors)
- Joel Stanley Rubin, Rhode Island
Political Science
- Stella Irene Rubin, New York
Psychology
- Denman Adams Rucker, Virginia
Political Science
- Marilynn Sacks, New York
Psychology
- Margaret Jane Salisbury, New York
Political Science
- Margaret Jean Saltzstein, District of
Columbia
French Language and Literature
- Helen Ann Sanders, Maryland
Political Science (With Distinction)
- Susan Lynn Sanders, Missouri
Psychology
- Roberta Lee Sandler, Massachusetts
Psychology
- John Michael Sando, Virginia
Political Science
- Wendy Harriet Saul, Pennsylvania
Psychology
- Judith Robin Scavron, New Jersey
Psychology
- Thomas Robert Schade, Ohio
Political Science
- Sally Ellen Schaefer, Virginia
Anthropology
- Susan Brown Schechter, Virginia
History
- Gloria Ellen Schlesinger, New York
Speech Pathology and Audiology
- Jane Quint Schlosberg, New York
Dramatic Art
- Sally Katherine Schneider, Pennsylvania
Sociology
- Deborah Nan Schoen, New York
History (With Distinction,
Special Honors)
- Amber Erna Scholtz, New York
Political Science
- Jeffrey James Schriver, Maryland
Political Science
- Martha May Scott, District of Columbia
American Civilization

Peter Byron Scott, Virginia
Fine Arts
David Henry Sculnick, Singapore
Anthropology
James Donald Schweitzer, Kentucky
Social Sciences
Sandra Ellen Segel, District of Columbia
Sociology
Douglas Shander, Pennsylvania
Psychology
Ellen Shapiro, Maryland
English Literature (Special Honors)
Diane Mona Sharp, District of Columbia
Spanish Language and Literature
Jeffrey Carlyle Shaw, Indiana
Economics
Gayle Milner Sheldon, District of
Columbia
Art History and Theory
Richard Barry Sher, District of Columbia
Philosophy
Susan Steiner Sher, New Jersey
Art History and Theory
Debra Shmeltz, Maryland
History
Bruce Norman Shulman, District of
Columbia
Political Science
Elizabeth Ann Siegel, Pennsylvania
French Language and Literature
Esther Siegel, New Jersey
History
Jay Monroe Silberner, New Jersey
Sociology
Jeffrey Howard Silver, Connecticut
Religion
Eugene David Silverman, District of
Columbia
Medicine
Steven Barry Silverman, New York
Psychology
Norma Ila Simkin, New Jersey
Sociology
Deborah Anne Simmers, Pennsylvania
English Literature
Walter Bernard Simmons, Jr., Texas
Social Sciences
Robert Martin Simpson, Pennsylvania
Political Science
Ilona Andra Sipars, District of Columbia
Art History and Theory
David Jonathan Sitomer, District of
Columbia
American Civilization
Charles Arthur Sklar, Delaware
Germanic Languages and Literatures

Bruce Marc Smith, California
Dramatic Art
Karen-Rose Smith, District of Columbia
English Literature
Michael Andrew Smith, Missouri
Economics (Special Honors)
Sandra Critchley Smith, New Jersey
Art History and Theory
Carol Frances Snow, Virginia
Sociology
Judith Anne Snyder, New York
French Language and Literature
Judith Mary Sobin, New York
Political Science
Frank Andrew Sobolewski, District of
Columbia
Political Science (With Distinction,
Special Honors)
Elizabeth Marie Solakian, Florida
English Literature
Samuel Soopper, Pennsylvania
Anthropology
Douglas Lee Southerland, Virginia
Anthropology
Peggy Ann Spiegelman, Pennsylvania
Art History and Theory
Marsha Day Spieth, Connecticut
Art History and Theory
Barbara Susan Springer, Oklahoma
History
Allen Mark Spivack, Delaware
Psychology
Howard Hamilton Sprow, New Jersey
Psychology
Karen Marie Staffieri, District of
Columbia
English Literature
Elizabeth Bradford Steele, Maryland
Philosophy
Robert Bernard Stegmaier III, Virginia
Economics
Marjorie Lynn Steinberg, New York
Psychology
Ronald Strieb, Pennsylvania
History (Special Honors)
David Henry Stringer, District of
Columbia
Psychology
Glenn Yoshimi Suetsugu, Hawaii
Psychology
Lynn Marcia Sussman, District of
Columbia
Fine Arts
Robert Arnold Sweatt, Jr., Virginia
Political Science

- Virginia Mykulin Sweeney, New York
Anthropology
- Judith Anne Szablak, New York
Sociology
- Keith Powell Taylor, Virginia
Anthropology
- Theron Leeroy Terbush, District of
Columbia
Mathematical Statistics
(With Distinction, Special Honors)
- David Israel Tevelin, Pennsylvania
American Civilization
- Michael Webb Thacher, California
Philosophy
- Kathleen Thompson, Virginia
Psychology
- Robert O'Neil Thompson, Virginia
Applied Statistics
- Suzanne Theo Schnurle Thomson,
Virginia
Anthropology
- Ronald James Tipton, Ohio
American Civilization
- Glenn Robert Totten, New York
Political Science
- William Paul Toutant, Massachusetts
Music History and Literature
(With Distinction)
- Mark Richard Treegoob, Pennsylvania
Psychology
- Daphne Anne Trent, New York
Art History and Theory
- Candace Ann Trerotola, Connecticut
Russian Language and Literature
- Kenneth Maurice Trombly,
Massachusetts
Anthropology
- Randolph Corbin Turberville, Virginia
Political Science
- Pamela Jessie Tweedy, Pennsylvania
American Civilization
- Paul Arthur Tweedy, Pennsylvania
Political Science
- James Warren Tyrrell, District of
Columbia
English Literature
- Paul Joseph Upman, Maryland
Zoology
- Bonnie Doris Ursin, Virginia
Fine Arts
- Sonia Elizabeth Valle, Venezuela
French Language and Literature
- Laura Elizabeth Vance, Virginia
Philosophy
- Marie Esterline Vance, District of
Columbia
History
- Gretchen Van Hyning, New York
American Civilization
- Jean Ellen Vanski, Connecticut
Mathematical Statistics
(Special Honors)
- Joyce Marie Vargyas, New Jersey
Psychology
- Patricia Elizabeth McDonell Verdisco,
Virginia
Anthropology
- Louise Hill Vidal, New York
Political Science
- Fernando Acosto Villarreal, Maryland
Medicine
- Barbara Lee Vogel, Virginia
English Literature
- Robert James Vollmerhausen, New York
Journalism
- Antonia Lyn Walker, New Jersey
History
- Madeleine Kendall Walker, Virginia
Anthropology
- LynLee Anne Walradt, California
Art History and Theory
- Philip Norman Walsh, Canada
Geography
- Constance Mary Wassel, New Jersey
Fine Arts
- Theodore Wasserman, New York
Psychology
- Margaret Olivia Weaver, Florida
Applied Music
- Anne Ilka Webb, Maryland
Philosophy
- Ulrich Ernst Weidemann, Florida
Geography
- Hazel Irene Weiser, District of Columbia
Sociology
- Mary Ann Weisiger, Virginia
English Literature
- Michael Andrew Weiss, New Jersey
History
- Susan Mae Wheelwright, Virginia
Psychology
- Rosalind Ann White, District of
Columbia
Psychology
- Michael Augustine Wiegard, Virginia
Political Science
- Andrea Carol Wigbels, District of
Columbia
Sociology
- Howard Wilensky, New Jersey
Political Science
- Martha Ellen Williams, Virginia
Journalism

Nancy Heerwagen Williams, District of
Columbia
English Literature
Paula Williams, District of Columbia
English Literature
Linda Sue Willinger, Virginia
American Literature
Joseph Mark Winkleman, Rhode Island
Sociology
Donald Kistler Winston, Nebraska
Social Sciences
Douglas Merrill Wisoff, New York
Economics
Stephen Thomas Witas, Maryland
Psychology
Jerome Lee Wolf, Pennsylvania
Political Science
Thomas Landon Wolpert, North
Carolina
Music History and Literature

Lois Ann Woodams, New York
Germanic Languages and Literatures
Virginia Wilson Worthington, District of
Columbia
Art History and Theory
Patricia Eileen Xander, Virginia
History
Corinne Rae Yamazaki, District of
Columbia
Anthropology
Marian Ruth Yeager, Pennsylvania
English Literature
Elizabeth Carroll Zahn, District of
Columbia
Art History and Theory
Larry Robert Zebrak, New York
Sociology
Paul Kirk Zeman, Jr., Illinois
Political Science

BACHELOR OF SCIENCE

John Richard Bacon, Maryland
Zoology (With Distinction)
Edward Lawrence Baker, District of
Columbia
Zoology
Susan Frances Bergstein, Maryland
Biology
Steven Isor Berman, Massachusetts
Zoology
Alan Michael Berne, Maryland
Zoology
Thomas Harding Clark, Virginia
Zoology
Howard Byron Cohen, Maryland
Zoology
Grayson Steven Davis, District of
Columbia
Zoology
Kent Christopher DiFiore, Nevada
Zoology
Thomas William Dolby, New Jersey
Zoology (With Distinction)
Niels Cary Engleberg, Maryland
Zoology
Terry Ray Frye, North Carolina
Chemistry
Mark Robin Geier, Maryland
Zoology
Alan Robert Gold, New York
Zoology
Steven Linwood Goldman,
Massachusetts
Zoology

Ronald Julian Gutman, New York
Zoology
Antoinette Tanis Hubenette, California
Zoology (With Distinction)
David Langkop Hurt, Virginia
Zoology
Harold Martin Jones, Maryland
Zoology
Jack Olian Kaplan, New York
Chemistry
Robert Leonard Kodeck, Maryland
Zoology
Maureen Patricia Maloney, New York
Biology
Robert Charles Rabinowitz, New Jersey
Chemistry (Special Honors)
Gene Mallard Ransom, Jr., Maryland
Physics
Jonathan James Rogers, Pennsylvania
Zoology
Frances Lathrop Sweeney, District of
Columbia
Zoology
Gwendolyn Sharon Thomas, District of
Columbia
Zoology
Roger Bernard Thomas, Maryland
Chemistry
Charles Hiram Thurber, Jr., Virginia
Biology
Terry David Zipper, District of
Columbia
Biology

BACHELOR OF SCIENCE IN GENERAL STUDIES

William Earl Bennett, Virginia
History

Robert Yates Newell III, Virginia
Mathematics

Nelson Sabin, Virginia
Political Science

BACHELOR OF SCIENCE IN GEODETIC AND CARTOGRAPHIC SCIENCE

Lawrence Deless Bowles, Maryland
Geodesy
Paul Farrington, Jr., Virginia
Geodesy

Larry Nelson Muncy, Virginia
Cartography

GRADUATE SCHOOL OF ARTS AND SCIENCES

MASTER OF ARTS

Stuart Appelle, District of Columbia
Psychology

B.S. 1967, Pennsylvania State
University

Susan Elizabeth Beneke, District of
Columbia
French Language and Literature
B.A. 1967, George Washington
University

Julia Deener Brent, Virginia
American Literature
B.A. 1958, Mary Baldwin College

Dennis Gene Canali, Massachusetts
Psychology
B.A. 1965, Boston University

William Paul Deary, Virginia
History
B.S. 1953, Manhattan College

Helen Muriel Eden, Maryland
Anthropology
B.A. 1942, Brooklyn College

Heather Christine Faulkner, District of
Columbia
English Literature

B.A. 1957, University of Birmingham,
England

Mark Joseph Florsheim, New York
Economics

B.A. 1964, Columbia University
LL.B. 1967, New York University

Michael Kerry Foley, New York
American Civilization
B.A. 1963, Colgate University

Billie Slayden Gnodde, New Jersey
French Language and Literature
B.A. 1965, George Washington
University

Yvonne Cook Greenfield, Virginia
French Language and Literature
B.A. in Ed. 1967, George Washington
University

William Hauptman, District of Columbia
Art History and Theory
B.A. 1968, George Washington
University

Jean Anita Haven, Maryland
French Language and Literature
B.A. 1964, Cornell University

Carolyn Meredith Herting, Pennsylvania
Museology
B.A. 1968, Wilson College, Pa.

Joseph Vincent Hickey, Virginia
Anthropology

B.A. 1967, George Washington
University

Marjorie Jane Hunt, Illinois
American Civilization

B.A. 1964, Bradley University

Philomena Bruna Iannotta, Pennsylvania
French Language and Literature
B.S. in Ed. 1965, California State
College, Pa.

Shail Bala Jain, India

Mathematical Statistics
B.A. 1968, George Washington
University

- Wallace Earl Larimore, Virginia
Mathematical Statistics
B.S. 1964, University of Utah
- Henry Linsert, Jr., Virginia
Economics
B.A. 1963, Duke University
- Patricia Kathleen Linskey, District of
Columbia
Anthropology
B.A. 1967, George Washington
University
- Laurie Carol Mandelbaum, District of
Columbia
French Language and Literature
B.A. 1967, Skidmore College
- Ghebeyhou Mekbib, District of
Columbia
Political Science
B.A. 1960, Haile Selassie I University,
Ethiopia
- Marilyn Moore Moors, Maryland
Anthropology
B.A. 1955, Tufts University
- Betty Loral Counts Osterhus, Virginia
Spanish Language and Literature
B.A. 1966, University of Louisville
- Dianne Alexander Rankin, Maryland
Political Science
B.A. 1966, George Washington
University
- Celso de Almeida Miguel Relvas, District
of Columbia
Economics
Bachelor (Philosophy) 1958, Faculdade
De Filosofia Nossa Senhora Medianeira,
Brazil
- William Francis Rogers II, Maryland
Geography
B.A. 1959, Clark University
- James Bernard Saunders, Jr., Virginia
History
B.A. 1967, University of Virginia
- Josephine Regar Schlagel, France
French Language and Literature
B.A. in Ed. 1961, George Washington
University
- Gloria Singer Schwartz, Maryland
Speech Pathology and Audiology
B.A. 1967, George Washington
University
- Elsie Marayno Selman, Virginia
Speech Pathology and Audiology
B.A. 1951, New York University
- LaVonne Marlene Siegel, Virginia
History
B.A. 1968, George Washington
University
- Ruth Ann Siler, Virginia
Economics
B.S. 1943, Case Western Reserve
University
- Victor John Smith II, Virginia
History
B.A. 1968, University of Virginia
- Judith Ellen Sobol, California
Museology
B.A. 1968, University of California,
Los Angeles
- Meredith Ralph Standley, Virginia
Sociology
B.S. 1957, Virginia Polytechnic
Institute
B.D. 1961, Emory University
- Lucille Vivian Morehouse Stevens,
District of Columbia
American Civilization
B.A. 1957, George Washington
University
- George Edwin Stuart, Virginia
Anthropology
B.S. 1956, University of South
Carolina
- John Munyeria Thiuri, District of
Columbia
Economics
B.A. 1963, St. Anselm's College
- Nancy Rogers Wall, District of Columbia
French Language and Literature
B.A. 1952, Coker College
- JoAnne Lightle Willette, Virginia
Sociology
B.A. 1968, George Washington
University
- George Wynns Williams, Maryland
Mathematical Statistics
B.S. 1968, Bucknell University
- Susan Lee Yeager, Maryland
History
B.A. 1967, George Washington
University
- Mahmoud Abdul Zawawi, Maryland
Geography
B.A. 1968, George Washington
University

MASTER OF FINE ARTS

- Martin Paul Amt, Maryland
Ceramics
B.A. 1966, George Washington University
- Albert Willard Bellais, Maryland
Dramatic Art
B.A. 1958, New Mexico State University
- Judith Kunzman Benderson, New Jersey
Painting
B.A. 1967, George Washington University
- Kelsey Eugene Collie, District of Columbia
Dramatic Art
B.A. 1967, George Washington University
- Myra Rae Herson, Maryland
Painting
B.F.A. 1967, Boston University
- Susan Ellen Howe, North Carolina
Painting
B.A. 1968, Coker College
- Agnes Peto Jacobs, District of Columbia
Painting
B.A. 1965, Barnard College
- Ethel Virginia Anne King, Maryland
Graphics
B.A. 1956, George Washington University
- Linda Sue Lowery, Virginia
Painting
B.F.A. 1964, Ohio Wesleyan University
- Annette Edna Petrie, Virginia
Graphics
B.A. 1960, Marquette University
- Laura Jane Seldman, District of Columbia
Graphics
B.S. 1967, Cornell University
- Robert Michael Tiemann, District of Columbia
Painting
B.A. 1967, George Washington University
- Joanne E. Williams, Connecticut
Painting
B.A. 1968, Marymount College, N.Y.

MASTER OF SCIENCE

- Aram Yacoub Balekjian, Maryland
Biochemistry
B.A. 1949, American University at Cairo, Egypt
- Robert Barry Finkelman, Maryland
Geology
B.S. 1965, City College, New York
- Rosann Ricarda Foster, Maryland
Biochemistry
B.S. 1968, University of Maryland
- Robert Gerald Heinze, Maryland
Anatomy
B.S. 1965, George Washington University
- Edward John Lehmann, Illinois
Chemistry
B.S. 1967, Washington College
- Faith Karola Nzelibe, Maryland
Mycology
B.A. 1964, Hiram College
- Edmund Alfred Olechowski, Connecticut
Anatomy
B.S. 1962, Georgetown University
- Susan Marie Pember, New York
Microbiology
B.A. 1966, State University of New York, College at New Paltz
- Harry Trevor Rainey, Jr., District of Columbia
Mathematics
B.S. 1959, University of Arizona
- Frances Moreland Sauro, Maryland
Anatomy
B.A. 1965, Dunbarton College of Holy Cross
- Jay Alan Siegel, Maryland
Chemistry
B.S. 1968, George Washington University
- Betty Rae Culp Stevick, Virginia
Microbiology
B.A. 1948, Boston University
- Page Climenson Valentine, Jr., Maryland
Geology
B.S. 1968, George Washington University

MASTER OF PHILOSOPHY

- Faye Joanne Baker, Vermont
American Civilization
B.A. 1959, Grinnell College
M.A.T. 1960, Yale University
- Robert David Barry, District of Columbia
Economics
B.A. 1959, University of California, Berkeley
- Jaap Wim Boosman, District of Columbia
Geology
B.S. 1957, M.S. 1959, Syracuse University
- Dolph Robert Chianichiano, New York
International Relations
LL.B. 1960, University of Virginia
B.S. in F.S. 1962, Georgetown University
- John Y. Cole, Jr., District of Columbia
American Civilization
B.A. 1962, M.L.S. 1963, University of Washington
M.I.A. 1966, Johns Hopkins University
- William Richard Dempsey, Virginia
History
B.A. 1967, George Washington University
- George Olney Driscoll, Jr., Virginia
Economics
B.A. 1966, George Washington University
- Lennard David Gerson, District of Columbia
Political Science
B.A. in Govt. 1964, M.A. 1966, George Washington University
- Donald Richard Hanscom, Virginia
Chemistry
B.A. 1967, George Washington University
- Salaheddin Salem Hasan, Virginia
History
B.A. 1960, University of Libya
M.A. 1963, University of California, Los Angeles
- Muhammad Hussain, District of Columbia
Mathematical Statistics
B.A. 1960, M.A. 1962, University of the Panjab, Pakistan
M.S. 1969, George Washington University
- Eshagh Emran Shaoul, Virginia
International Relations
B.A. 1967, Hofstra University
M.A. 1969, City College, New York
- Hillel Spitz, Maryland
Mathematical Statistics
B.A. 1943, George Washington University
M.S. 1945, Brown University
- Richard Eugene Wentz, Pennsylvania
History
B.A. 1948, Ursinus College
B.D. 1951, Lancaster Theological Seminary
- Vera Zdravkovic, Maryland
Chemistry
B.S. 1962, University of Belgrade, Yugoslavia
M.S. 1966, University of Novi Sad, Yugoslavia

DOCTOR OF PHILOSOPHY

- John William Boettjer, Virginia
American Civilization
Dissertation: *The Autobiography of the American Businessman*
B.A. 1961, M.A. 1963, George Washington University
- Craig Morrison Cleaves, Virginia
Psychology
Dissertation: *The Control of Muscle Tension through Psychophysiological Information Feedback*
B.A. 1962, Bowdoin College
M.A. 1965, M.Phil. 1969, George Washington University
- Anthony Thomas Cluff, Virginia
Economics
Dissertation: *Prices, Unit Labor Costs, and Profits—an Examination of Wesley C. Mitchell's Business Cycle Theory for the Period 1947-1969*
B.S. 1962, M.S. 1964, Utah State University of Agriculture and Applied Science

- Roger Guion Davis, Virginia
History
Dissertation: *Conscientious Cooperators: The Seventh-day Adventists and Military Service, 1860-1945*
B.A. 1963, Union College, Nebr.
M.A. 1968, George Washington University
- Margarita Katarina Dobert, District of Columbia
International Relations
Dissertation: *Civil and Political Participation of Women in French-speaking West Africa*
M.A. 1932, School of Business Administration, Berlin, Germany
- Charles Herbert Doolittle III, Rhode Island
Pharmacology
Dissertation: *Studies on the Significance of Growth and Division in the Absence of DNA Synthesis Produced by 5-Fluorouracil Inhibition in Bacteria*
B.S. 1962, M.A. 1965, University of Massachusetts
- Mohammad Fatemi, Virginia
Physics
Dissertation: *The Detection of Dislocations in Metal Whiskers by X-ray Topography*
B.S. 1962, M.S. 1965, George Washington University
- Joy Ann Frechtling, District of Columbia
Psychology
Dissertation: *Situational Determinants of Color-Form Salience in Matching and Learning Tasks*
B.A. 1965, Vassar College
M.A. 1966, Stanford University
- Geraldine Agnes Graham, Maryland
Psychology
Dissertation: *The Effects of Material and Social Incentives on the Performance on Intelligence Test Tasks by Lower-class and Middle-class Negro Preschool Children*
B.A. 1959, M.A. 1962, George Washington University
- Robert Roy Herr, Virginia
Botany
Dissertation: *Studies on Host-Pathogen Interaction of Plasmodiophora Brassicae Wor. with Cabbage Cells Cultivated in vitro*
B.S. in Ed. 1951, Kent State University
M.Phil. 1969, George Washington University
- Elizabeth Dwyer Hillenbrand, Maryland
Psychology
Dissertation: *Father Absence in Military Families*
B.A. 1950, Mount Holyoke College
M.A. 1965, George Washington University
- Alice Fenimore Hogans, Pennsylvania
Pharmacology
Dissertation: *Biosynthesis of Ribonucleic Acid in Rat Brain*
B.A. 1945, MacMurray College
M.S. 1950, Cornell University
- Gisela Bialik Huberman, Maryland
Spanish Literature
Dissertation: *La historia del desarrollo de la lingüística española en los siglos XIX y XX*
B.A. 1964, M.A. 1965, George Washington University

- Jean B. Intermaggio, Virginia
 Psychology
 Dissertation: *Some Factors Determining Visitors' Perceptions of the United States*
 B.S. 1945, College of William and Mary
 M.A. 1946, Columbia University
- Edward Naim Kassira, Virginia
 Microbiology
 Dissertation: *Delayed-type Hypersensitivity in Guinea Pigs as an Aid to Differentiation of Chlamydial Agents*
 M.B., Ch.B. 1959, University of Baghdad, Iraq
 M.P.H. 1965, Johns Hopkins University
 M.S. in Hygiene 1967, Harvard University
- James Anthony Kellogg, Maryland
 Microbiology
 Dissertation: *Actions of Amicetin on Mycobacterium Phlei*
 B.S. 1962, Bucknell University
- Lee Murray Kindley, Virginia
 Chemistry
 Dissertation: *Photoreduction of Benzophenone and Its p-Alkyl Substituted Derivatives in Isopropyl Alcohol*
 B.A. 1942, Western Maryland College
 M.S. 1957, Stevens Institute of Technology
- James Alfred Lee, Maryland
 Human Ecology
 Dissertation: *Toward an Ecologic Understanding of Human Health and the Man-Environment Relationship, Including Elements of a National Strategy for a Livable Environment*
 B.S. 1949, Union College, N.Y.
 M.S. 1951, Cornell University
 M.Phil. 1969, George Washington University
- Donald Richard Lehman, Virginia
 Physics
 Dissertation: *Electromagnetic Breakup of $A=3$ Nuclei*
 B.A. 1962, Rutgers, the State University
 M.S. 1964, Air Force Institute of Technology
- Cornelius Glen McWright, Virginia
 Microbiology
 Dissertation: *Immunochemical and Electrophoretic Studies of Cancer-patient Sera*
 B.A. 1952, Evansville College
 M.S. 1965, George Washington University
- Edwin Curran Murphy, Jr., Maryland
 Microbiology
 Dissertation: *The Chemical and Antigenic Properties of the Ribosomes and Ribosomal Fraction of Mycobacterium tuberculosis H37Ra*
 B.A. 1965, Catholic University of America
- Chong Kee Park, Maryland
 Economics
 Dissertation: *An Analysis of Income Elasticity of the Tax Yield in Korea*
 B.A. 1957, Westminster College, Utah
 M.A. 1959, University of Illinois

Virginia Cardwell Purdy, Virginia

History

Dissertation: *Portrait of a Know-Nothing Legislature: The Massachusetts General Court of 1855*

B.A. 1942, University of South Carolina

M.A. 1960, George Washington University

Joan Marian Shagan, District of Columbia

Psychology

Dissertation: *Kinesthetic Memory, Comparing the Blind and Sighted*

B.A. 1961, University of Maryland

M.A. 1965, George Washington University

Abdelaleem Mohammad Abdelrahman Sharshar, District of Columbia

Economics

Dissertation: *Comparative Survey of Theories of Public Enterprise*

B.Com. 1956, Cairo University, Egypt

M.A. 1963, Williams College

M.Phil. 1969, George Washington University

Nikolaos Athanasios Stavrou, Maryland

Political Science

Dissertation: *Pressure Groups in the Greek Political Setting*

B.A. 1963, Hunter College

M.A. in Govt. 1965, George Washington University

Ch'ao-sheng Sung, Maryland

Political Science

Dissertation: *Power Politics in Communist China, 1959-1966*

B.A. 1959, Tunghai University, Taiwan

M.A. 1963, University of Wisconsin

M.Phil. 1969, George Washington University

Morton Frank Taragin, Maryland

Physics

Dissertation: *The Mössbauer Effect in Iron and Europium Glasses*

B.S. in Engr. 1965, M.Phil. 1969, George Washington University

Anna Varghese Thomas, India

Chemistry

Dissertation: *Interaction between Closely Spaced Chromophores in Rigid Model Compounds*

B.S. 1955, Madras University, India

M.S. 1958, Kerala University, India

Ruth Anne Voth, Virginia

American Literature

Dissertation: *The Lyric Strain: A Study of the Heroine of the Old South*

B.A. 1955, Texas College of Arts and Industries

M.A. 1958, University of Maryland

Richard Steven Weissberg, District of Columbia

Chemistry

Dissertation: *Some Topics in the Thermodynamics of the Molten Alkali Halides and Their Mixtures, with Emphasis on the Metathetical Reactions*

B.S. 1963, M.Phil. 1969, George Washington University

SCHOOL OF MEDICINE

DOCTOR OF MEDICINE

Flavius Abiola Akerele, Nigeria

B.A. 1966, Boston University

Jules Richard Altfas, Arizona

B.A. 1966, Arizona State University

Robert Anderson, Jr., California

B.S. 1966, Michigan State University

Joseph Milo Andrus, Virginia

B.S. 1965, Stanford University

- Emanuel David Ascarelli, Maryland
B.S. 1966, State University of New York at Albany
- Thomas Edgar Bageant, Virginia
B.A. 1966, Western Maryland College
- John Andrew Balacki, Virginia
B.S. 1966, Canisius College
- Sherwood Washington Barefoot, Jr., North Carolina
B.A. 1963, Duke University
- Gregory William Benkovic, Connecticut
B.A. 1966, Johns Hopkins University
- Robert Wayne Bonar, Maryland
B.S. 1966, College of Idaho
- Ronald Calvin Burton, Virginia
B.S. 1965, University of Utah
- Dennis Lane Canon, New Mexico
B.S. 1966, University of Arizona
- Andrew Anthony Ceavatta, Jr., Virginia
B.A. 1966, Franklin and Marshall College
- Nicholas Anthony Cerimele, Ohio
B.S. 1965, University of Pittsburgh
- Donna-Marie Therese Christian, Virgin Islands
B.S. 1966, St. Mary's College, Ind.
- Leo Joseph Patrick Clark, New Jersey
B.S. 1966, University of Notre Dame
- Gerald Fredric Davis, New York
B.S. 1966, University of Missouri
- James Ward Delameter, Washington
B.A. 1966, University of Washington
- George Gerald Edwards, District of Columbia
B.A. 1966, San Jose State College
- Maureen Crittenden Edwards, Maryland
B.S. 1966, Marquette University
- John Roy Emmett, Florida
B.S. 1965, Georgia Institute of Technology
- M.S. 1968, Baylor University
- Robert Melvin Fine, Maryland
B.A. 1967, George Washington University
- Gerald Penny Ford, Virginia
B.A. 1965, Brigham Young University
- Peter Charles Freis, Jr., Virginia
B.S. 1966, St. Peter's College, N.J.
- Henry Francis Gardstein, Jr., New York
B.A. 1966, Franklin and Marshall College
- Robert John Gerety, Virginia
B.A. 1962, Rutgers, the State University
- M.A. 1966, Ph.D. 1967, Stanford University
- Peter R. Gerkin, New Jersey
- Jay Stephen Goldberg, New York
B.A. 1966, State University of New York at Binghamton
- Eric Edwin Goranson, Washington
B.S. 1966, Washington State University
- Kathryn Kenders Guyton, Maryland
B.S. 1966, Juniata College
- Charles Richard Hartz, Montana
B.A. 1966, Concordia College, Moorhead, Minn.
- Robert Gerald Heinze, Maryland
B.S. 1965, George Washington University
- S. Paul Herndon IV, Georgia
B.S. 1966, Georgetown University
- Thomas Edward Higgins, Virginia
B.S. 1966, Fordham University
- Malcolm Douglas Hill, California
B.S. 1965, Stanford University
- Edward Lloyd Hines, Connecticut
D.D.S. 1967, Columbia University
- Jack Henry Hirsch, Maryland
B.A. 1966, Washington and Jefferson College
- Barbara Reddy Hoart, Virginia
B.A. 1966, University of Pennsylvania
- John Carl Hoefs, Maryland
B.A. 1966, California Lutheran College
- Jon Sigurd Huseby, Maryland
B.A. 1966, Brown University
- Roger Clark Husted, California
B.S. 1966, Brigham Young University
- Taylor Alan Jeppson, Utah
B.A. 1966, University of Utah
- Norman Bruce Jetton, Virginia
B.A. 1967, George Washington University
- Michael Richard Jones, New Jersey
B.A. 1966, Franklin and Marshall College
- Louis Tshisuaka Kanda, District of Columbia
B.A. 1966, University of California, Los Angeles
- John Joseph Katona, New York
B.S. 1965, Pennsylvania State University
- Wilburn William Lewis Kent, Mississippi
B.A. 1966, Johns Hopkins University
- Rodney Bernard Kovick, Montana
B.S. 1966, University of Washington
- Ronald Bruce Lamb, Maryland
B.S. 1966, University of Redlands

- Charles Edward Law, Jr., Virginia
B.S. 1966, George Washington University
- Paul Elwood Lewis II, Maryland
B.A. 1966, Johns Hopkins University
- Richard Allan Lewis, Maryland
B.A. 1966, Queens College, N.Y.
- Jon Edward Long, Arizona
B.S. 1965, University of Arizona
- John William Lyles, Jr., Maryland
B.M.E. 1954, Cornell University
- William Stafford Lynch, Ohio
B.S. 1966, University of Notre Dame
- Winthrop Sylvester MacLaughlin, Jr., Connecticut
B.S. in Phar. 1966, Fordham University
- Warren Clark Marshall II, Virginia
B.S. 1966, Pennsylvania State University
- Milton James Menchey, Maryland
B.A. 1966, San Diego State College
- Malcolm Kent Mewha, Pennsylvania
B.A. 1966, University of Pennsylvania
- Paul Dennis Miller, Virginia
(With Distinction)
B.A. 1965, Gettysburg College
M.S. 1966, George Washington University
- Paul Ralph Mitchell, Massachusetts
B.S. 1966, University of Massachusetts
- Thomas Eugene Moeser, Maryland
B.A. 1967, George Washington University
- Warren Frederick Muth, Virginia
B.A. 1964, Gettysburg College
- Fred Gordon Odere, New York
B.S. 1966, Carnegie-Mellon University
- Alan Joseph Oram, Virginia
B.S. 1966, Mount St. Mary's College, Md.
- Robert Clark Osborne, Maryland
B.A. 1966, University of California, Los Angeles
- Robert Clemmer Palmer, New Mexico
B.S. 1966, University of New Mexico
- John Cheung Pan, Hong Kong
B.S. 1966, University of Notre Dame
- Philip Paul, New York
B.A. 1964, Brandeis University
- George Cannon Pugsley, Virginia
B.S. 1966, University of Utah
- Burton L. Redd, Texas
B.S. 1967, University of Utah
- John Stafford Rogers II, Maryland
B.S. 1966, University of Maryland
- Richard Mason Rytting, Virginia
B.S. 1966, University of Utah
- Salvatore Carl Santangelo, Maryland
B.A. 1965, Catholic University of America
- Joseph Boyle Sappington, Maryland
B.S. 1965, Georgetown University
- Anita Koosman Schnur, New Jersey
B.A. 1966, Rutgers, the State University
- Gabriel Frank Sciallis, New Jersey
B.A. 1966, Rutgers, the State University
- Samuel Jack Scott, Jr., Virginia
(With Distinction)
B.S. 1966, George Washington University
- Marc Robert Segall, New Jersey
- Robert Jay Singer, Maryland
B.S. 1966, Pennsylvania State University
- Charles Ira Smith, Virginia
B.S. 1966, Syracuse University
- Charles Edward Snyder, West Virginia
B.A. 1966, West Virginia University
- Michael Sandor Sommer, Maryland
B.A. 1959, M.A. 1964, George Washington University
- Harold Philip Strunk, Pennsylvania
B.A. 1966, Yale University
- Ralph Toshio Suetsugu, Hawaii
B.A. 1966, Johns Hopkins University
- Patrick Joseph Sullivan, Virginia
(With Distinction)
- Michael Eric Sussman, New Jersey
B.A. 1966, Franklin and Marshall College
- Richard Landon Taylor, Jr., Ohio
- Paul Jan Thomas, Maryland
B.S. 1966, University of Maryland
- Eric Martin Wagshal, Maryland
B.A. 1967, George Washington University
- Richard LaVell Ward, Virginia
B.S. 1966, Brigham Young University
- Michael DeMonte Washburn, Virginia
- Victor Peter Wasilaskas, Virginia
B.S. 1966, Mount St. Mary's College, Md.
- Melvin Phillip Weinstein, New Jersey
B.A. 1966, Rutgers, the State University
- Joseph Daniel Welch, New York
B.A. 1966, Johns Hopkins University
- Richard Michael Whalen, Montana
B.S. 1966, Montana State University
- John Duane Wojcik, Maryland
(With Distinction)
B.S. 1966, Georgetown University

Craig Duryea Woodard, New York
B.A. 1966, Johns Hopkins University

Michael Bruce Wooten, Florida
B.S. 1966, Washington State University

NATIONAL LAW CENTER

JURIS DOCTOR

Warren William Ament, Virginia
B.A. 1963, University of Michigan
Brian Evan Barkley, Maryland
(With Honors)
B.A. 1967, University of Maryland
Donald Michael Barnes, Virginia
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B.S. in I.E. 1965, Pennsylvania State University
Robert Stewart Barney, District of Columbia
B.S. in Ed. 1964, Southeast Missouri State College
Baheej William Basheer, Virginia
B.S. 1965, U.S. Air Force Academy
Ralph Richardson Beard, District of Columbia
B.B.A. 1966, George Washington University
Eric Lawrence Bernthal, New York
(With Honors)
B.A. 1967, Columbia University
Bonnie Eaton Bing, North Carolina
(With Honors)
B.A. 1967, George Washington University
Robert Emory Blankenbaker, District of Columbia
(With Honors)
B.Ch.E. 1966, University of Virginia
Robert Thomas Bloom, Virginia
B.A. 1967, Hofstra University
Philip Dominic Bogetto, Hawaii
B.S. in F.S. 1965, Georgetown University
Basil Theodore Bozonelis, New Jersey
(With Honors)
B.A. 1967, Rutgers, the State University
Herbert Donald Broman, Virginia
B.A. 1961, University of Maryland
M.B.A. 1962, American University
Marvin Alan Brookner, District of Columbia
B.A. 1967, Brown University
Richard Kurt Burch, Virginia
B.A. 1966, Wichita State University
Francis Lewis Burk, Jr., Virginia
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B.A. 1965, Dartmouth College

Charles Finley Byrd, Michigan
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B.S. in B.A. 1965, Wayne State University
William Howard Cable, District of Columbia
B.S. 1967, University of Wisconsin
James Albert Calderwood, Maryland
(With Honors)
B.S. 1964, University of Maryland
Mark Raymond Canoyer, Virginia
(With Honors)
B.B.A. 1966, Ohio University
Ralph Vicent Caputo, New York
B.A. 1966, Georgetown University
Jay Laurie Carlson, District of Columbia
(With Honors)
B.S. 1965, University of Wisconsin
Kerry Lee Cathcart, Iowa
(With Honors)
B.A. 1967, Drake University
William James Chen, Jr., Maryland
B.A. 1966, American University
Joseph Martin Chomski, New York
B.A. 1967, George Washington University
Linda Ann Cinciotta, Maryland
(With Highest Honors)
B.S. 1965, Georgetown University
Jeffrey Marshall Clyman, New York
(With Honors)
B.A. 1967, University of Vermont
John Elbert Coblentz, Indiana
B.S. 1965, U.S. Air Force Academy
M.A. 1966, Georgetown University
Robert Philip Cogan, New York
(With Honors)
B.E. 1966, Cooper Union
Edward Bert Cohen, New York
(With Honors)
B.S. 1967, Lehigh University
Stuart Richard Cohen, New York
(With Honors)
B.S. 1967, Brooklyn College
Lynn Ray Collins, Maryland
(With Honors)
B.S. 1964, Brigham Young University
Richard Anthony Conti, New Jersey
B.A. 1967, Merrimack College

- Barry Arnold Cooper, Maryland
(With Honors)
B.E. 1966, City College, New York
- Roger Moore Craver, Virginia
(With Honors)
B.A. 1963, Dickinson College
- Clarence Acklin Crumrine, Pennsylvania
B.A. 1967, Washington and Jefferson
College
- Jill Cummings, Maryland
(With Honors)
B.A. 1958, Vassar College
- Ulysses Davis, Connecticut
B.A. 1953, University of Iowa
M.S. 1962, University of Bridgeport
- Dennis William Dohnal, Virginia
B.A. 1967, Bucknell University
- Charles Richard Donohoe, Virginia
B.E.E. 1964, M.S. 1965, Ohio
State University
- Nancy Rohrer Dorsch, Maryland
B.A. 1953, Smith College
Ed.M. 1955, University of Pittsburgh
- Alfred Franklin Dougherty, Jr., District
of Columbia
(With Honors)
B.S. 1963, U.S. Naval Academy
- John Atterbury Dugger, District of
Columbia
(With Honors)
B.S. 1945, U.S. Naval Academy
M.A. 1960, American University
- Allen Theophilus Eaton, Virginia
(With Honors)
B.S. 1956, West Virginia State College
- Martin Sorrell Echter, Connecticut
(With Honors)
B.A. 1964, Dartmouth College
- George Lukens Edgar, District of
Columbia
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B.A. 1963, B.M.E. 1964, Dartmouth
College
- Mary Ann Efroymsen, District of
Columbia
(With Honors)
B.A. 1965, Wellesley College
- Richard Emanuel, New York
B.A. 1967, University of Connecticut
- Henry Louis Feuerzeig, Maryland
(With Honors)
B.S. 1962, University of Wisconsin
- S. David Fineman, Maryland
(With Honors)
B.A. 1967, American University
- Carl Robert Fogelberg, District of
Columbia
B.A. 1963, Dartmouth College
- Francis William Foote II, New York
B.A. 1967, Washington and Lee
University
- Mark Alan Forman, New Jersey
(With Honors)
B.S. 1967, Pennsylvania State
University
- Stephen Joseph Fortunato, Virginia
(With Honors)
B.A. 1965, Providence College
- Robert George Friedman, New York
(With Honors)
B.S. 1967, New York University
- Allen Richard Frischkorn, Jr., Virginia
(With Honors)
B.A. 1967, Pennsylvania State
University
- Judith Anne Fullerton, Oklahoma
B.A. 1966, Vassar College
- Frank Robert Gailor, Virginia
(With Honors)
B.S. 1962, South Dakota State
University
M.P.A. 1963, Syracuse University
- John Martin Gibbons, Virginia
(With Honors)
B.S. 1962, University of Houston
- Elizabeth Quarles Glennon, Virginia
(With Honors)
B.A. 1954, Pomona College
- Paul John Gossens, Wisconsin
(With Honors)
B.A. 1962, Catholic University of
America
- Charles Scott Graber, Virginia
B.A. 1967, The Citadel
- Robert Lee Green III, Virginia
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B.A. 1967, Johns Hopkins University
- Martin Lewis Grossman, New Jersey
(With Honors)
B.S. in Econ. 1967, University of
Pennsylvania
- Steven Charles Haas, New York
B.A. 1967, Syracuse University
- James Ullman Hamersley, Idaho
B.A. 1965, University of Utah
M.A. 1967, University of Denver
- John Richard Hansen, Maryland
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B.A. 1965, George Washington
University

- Bruce Harold Hanson, Wisconsin
 (With Honors)
 B.S. 1967, University of Wisconsin
 Randy Alan Harris, Illinois
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 B.A. 1967, Grinnell College
 Robert Bruce Harwin, New York
 B.A. 1967, Miami University
 Jack Hassid, New York
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 B.A. 1967, Hofstra University
 Mellie Hanks Hickey, North Carolina
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 B.A. 1967, Sweet Briar College
 Phillip Michael Howe, Massachusetts
 B.A. 1967, College of the Holy Cross
 William Russell Huber, Virginia
 B.S. 1932, U.S. Military Academy
 M.B.A. 1950, University of Michigan
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 B.A. 1966, Brigham Young University
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 B.A. 1965, Brigham Young University
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 B.A. 1963, Catholic University of
 America
 Bernard Phillip Jeweler, Maryland
 (With Honors)
 B.A. 1967, University of Maryland
 John Hamilton Johnston, Virginia
 B.A. 1967, American University
 William Kalish, Virginia
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 B.A. 1967, University of Pittsburgh
 Jay Robert Kanengiser, New Jersey
 B.A. 1967, Columbia University
 Anthony Joseph Karrat, New York
 B.A. 1967, University of Notre Dame
 Craig Dean Katz, New Jersey
 B.A. 1967, University of North
 Carolina at Chapel Hill
 Martin Victor Katz, New York
 (With Honors)
 B.A. 1967, Queens College, N.Y.
 Robert Neil Kaye, New York
 (With Honors)
 B.S. 1967, New York University
 Peter William Kendall, District of
 Columbia
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 B.A. 1967, Temple University
 Bradford Elby Kile, District of Columbia
 B.M.E. 1966, Ohio State University
 Nancy Judith Kleeman, District of
 Columbia
 (With Honors)
 B.A. 1967, Wellesley College
 Richard David Kleman, Virginia
 (With Honors)
 B.A. 1962, Duquesne University
 Alan Edward Kopecki, Virginia
 (With Honors)
 B.M.E. 1966, Villanova University
 Anne Miller Kornbau, Maryland
 B.S. 1966, Drexel Institute of
 Technology
 Frank Kurt Krueger, Jr., Maryland
 (With Honors)
 B.A. 1967, Johns Hopkins University
 James Randall Kruse, Virginia
 (With Honors)
 B.A. 1967, Nebraska Wesleyan
 University
 Raymond Prentiss Lamb, District of
 Columbia
 B.A. 1967, Dartmouth College
 Robert Edwin Levine, Maryland
 B.A. 1967, George Washington
 University
 Charles Stephen Levy, Illinois
 (With Honors)
 B.A. 1967, Boston University
 Elise Anne Lewis, District of Columbia
 B.A. 1967, University of Pennsylvania
 Erik Robbins Lieberman, Pennsylvania
 B.A. 1967, University of Pittsburgh
 William Robert Loftus, Maryland
 (With Honors)
 B.S. 1967, Utah State University of
 Agriculture and Applied Science
 Bruce Michael Louiselle, Virginia
 (With Honors)
 B.A. 1965, George Washington
 University
 John Kyle Lunsford, Maryland
 (With Honors)
 B.A. 1966, Olivet Nazarene College
 Alexander Weal Mackie, District of
 Columbia
 (With Honors)
 B.A. 1967, Claremont Men's College
 Marion Montagu MacRae, Virginia
 (With Honors)
 B.A. 1967, Sweet Briar College
 Robert Lucien Maddex, Jr., West Virginia
 (With Honors)
 B.A. 1965, George Washington
 University

- Joseph Robert Magnone, Virginia
B.S. in Ch.E. 1965, University of Pittsburgh
- Robert Edwin Mangels, Virginia
(With Honors)
B.A. 1965, Pennsylvania State University
- John Bertram Mann, Virginia
(With Honors)
B.A. 1967, Duke University
- Stephen George Margeton, Virginia
B.A. 1967, Mount St. Mary's College, Md.
- Alan David Marrus, District of Columbia
(With Honors)
B.A. 1967, Brooklyn College
- Susan April Marshall, District of Columbia
(With Honors)
B.A. 1967, Vassar College
- Douglass John McCollum, Virginia
(With Honors)
B.A. 1967, Duke University
- John Cameron McNett, Maryland
B.S. 1967, Purdue University
- Joel Barry Miller, New York
B.B.A. 1967, Adelphi University
- Cynthia Hardin Milligan, Nebraska
(With Honors)
B.A. 1967, University of Kansas
- Robert Bartow Mitchell, Jr., District of Columbia
B.S. 1957, Lehigh University
- Bruce Edward Mones, District of Columbia
B.A. 1967, Franklin and Marshall College
- Paul Albert Moore, New York
(With Honors)
B.A. 1967, Franklin and Marshall College
- Philip Lawton Moore, District of Columbia
B.S. 1967, Bucknell University
- Anthony Charles Moscato, Maryland
B.A. 1967, Columbia University
- Henry Joseph Nardi, Pennsylvania
B.A. 1965, Lehigh University
- Harvey Joel Nathan, District of Columbia
(With Honors)
B.A. 1967, Brooklyn College
- Ronald Samuel Naveen, Pennsylvania
(With Honors)
B.A. 1967, University of Pennsylvania
- John Michael Neary, Virginia
B.S. 1966, C.W. Post College
- James Edward Nesland, Virginia
(With Honors)
B.A. 1966, University of Denver
- Kris Richard Nielsen, Virginia
(With Honors)
B.S.E. 1967, Princeton University
- Thomas Paul Nussbaum, New York
B.A. 1967, Hamilton College
- Bryn Roe Ostby, Virginia
(With Honors)
B.A. 1964, St. Olaf College
- Elaine Margaret Palumbo, Maryland
(With Honors)
B.A. 1967, George Washington University
- Whilden Sessions Parker, Virginia
(With Honors)
B.Gen.Std. 1960, Louisiana State University
- Richard Henry Parker, Jr., Texas
B.A. 1967, University of Houston
- Jeffrey Alan Peck, Virginia
(With Honors)
B.A. 1967, Syracuse University
- David Herschel Pennell, Alaska
Ed.B. 1960, University of Alaska
- Lynde Harrison Pillsbury, District of Columbia
(With Honors)
B.A. 1965, Yale University
- Robert Lee Polk, Virginia
B.A. 1962, Berea College
- Stephen Eric Powell, Maryland
B.A. 1967, Franklin and Marshall College
- Lanny Martin Proffer, Virginia
B.A. 1964, Southeast Missouri State College
- Charles Edward Quarton, Virginia
(With Honors)
B.S. in E.E. 1966, Northwestern University
- Samuel Richman Raskin, District of Columbia
(With Honors)
B.S. 1961, City College, New York
- George Thomas Reynolds, Jr., New Jersey
B.A. 1967, Wesleyan University
- John Peter Roddy, District of Columbia
B.S. in F.S. 1967, Georgetown University
- Gerald Arthur Rosen, District of Columbia
(With Honors)
B.A. 1951, Swarthmore College
M.A. 1956, Tufts University

- James Alan Rosen, Pennsylvania
(With Honors)
B.A. 1967, University of Pittsburgh
- Mark Alan Rosen, District of Columbia
B.A. 1967, University of Louisville
- Alan Ira Rubinstein, Virginia
(With Honors)
B.A. 1967, Long Island University
- Donald Wisdom Ruff, New Jersey
B.S. in B.A. 1967, Seton Hall University
- Larry Lynn Ruth, Nebraska
B.A. 1967, Nebraska Wesleyan University
- Henry Lambert Sadler III, Virginia
(With Honors)
B.S. 1967, Georgia Institute of Technology
- Kenneth David Salomon, Connecticut
(With Honors)
B.A. 1967, Tufts University
- Earl Allen Sanders, North Carolina
B.A. 1967, George Washington University
- John Thomas Sapienza, Jr., Maryland
(With Honors)
B.A. 1964, University of Pennsylvania
- Michael Asher Schlanger, New York
(With Honors)
B.A. 1965, Columbia University
- Howard Bruce Schneider, New Jersey
(With Honors)
B.A. 1967, Montclair State College
- Jerold Ira Schneider, Virginia
(With Honors)
B.S. in E.E. 1964, Newark College of Engineering
- Stuart Harold Schuman, Pennsylvania
(With Honors)
B.A. 1967, University of Pennsylvania
- Kathleen Schwab, New York
B.A. 1965, Wellesley College
- Edward Schwartz, Maryland
B.S. 1942, DePaul University
- M.A. 1953, Ph.D. 1954, Northwestern University
- Sherry Sue Seiber, Pennsylvania
B.A. 1966, Ohio University
- Steven Robert Semler, New York
B.A. 1967, Hunter College
- Sol Sheinbein, Maryland
(With Honors)
B.E. 1966, City College, New York
- Robert Alan Sideman, Illinois
B.A. 1967, University of Michigan
- John Prince Siler, Michigan
(With Honors)
B.A. 1966, Yale University
- Alan Lawrence Sirkin, Maryland
(With Honors)
B.A. 1961, M.B.A. 1965, University of Cincinnati
- Barney Joseph Skladany, Jr., New Jersey
B.A. 1967, Rutgers, the State University
- Warren Alan Sklar, Virginia
B.S. in E.E. 1966, Case Western Reserve University
- Robert Rennslaer Smiley III, District of Columbia
(With Honors)
B.S. 1956, U.S. Naval Academy
- Peter Richard Steenland, Jr., New Jersey
(With Honors)
B.A. 1967, George Washington University
- Robert Jay Stein, West Virginia
(With Honors)
B.A. 1966, Antioch College
- Jon Ross Stover, Maryland
B.A. 1967, Wesleyan University
- James William Coffman Swartz, Illinois
B.A. 1966, Yale University
B.A., M.A. 1968, Oxford University, England
- Stephen Jensen Swift, District of Columbia
(With Honors)
B.A. 1967, Brigham Young University
- Donald Howard Tamis, Virginia
B.A. 1967, Tufts University
- Ronald Jerome Tanis, Virginia
(With Honors)
B.S. 1960, M.A. 1967, Western Michigan University
- Lewis Franklin Tesser, New York
(With Honors)
B.A. 1967, Queens College, N.Y.
- Joel Stuart Turtle, New York
(With Honors)
B.S. 1967, American University
- Myron Dow Walker, District of Columbia
(With Honors)
B.A. 1967, Ohio Wesleyan University
- Kenneth Dale Walma, Virginia
B.A. 1962, University of Michigan
- John Matthew Walsh, Maryland
(With Honors)
B.E.E. 1962, City College, New York
- Charles Edmund Wands, Virginia
B.E.E. 1966, Georgia Institute of Technology

Lawrence Howard Wechsler, New York
(With Honors)
B.S. in Acct. 1967, Pennsylvania State University
Jay Robert Weill, Maryland
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B.A. 1967, University of Michigan
Steven Shelton Weiser, New York
B.A. 1967, Queens College, N.Y.
Samuel Held Weissbard, Maryland
(With Highest Honors)
B.A. 1967, Case Western Reserve University
Linda Fischer Wells, District of Columbia
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B.A. 1961, University of Florida
M.A. 1962, University of Washington
Richard Gayle White, Virginia
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B.A. 1967, Harvard University

Mark Robin Wiener, District of Columbia
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B.A. 1967, Wesleyan University
George Wilgus III, New Jersey
B.A. 1967, Princeton University
Walter Thacher Winslow, Jr., District of Columbia
(With Honors)
B.A. 1966, Harvard University
Frederic Loring Wood, Pennsylvania
(With Honors)
B.A. 1967, University of Pennsylvania
Russell Scott Woodward, California
(With Honors)
B.A. 1967, Claremont Men's College
Robert Joseph Zweben, District of Columbia
(With Honors)
B.A. 1967, Brandeis University

MASTER OF LAWS

Edwin Willard Bartine II, Iowa
B.S. 1964, Iowa State University of Science and Technology
J.D. 1967, University of Iowa
George Browning III, District of Columbia
Taxation
B.S. 1964, Central Missouri State College
J.D. 1965, University of Missouri
Richard Sutton Buck IV, District of Columbia
Labor Law
B.A. 1958, University of Maryland
J.D. 1961, George Washington University
Richard Ward Buhrman, Tennessee
Taxation
B.A. 1963, University of Tennessee at Chattanooga
LL.B. 1966, Duke University
Robert Lewis Chase, Rhode Island
Taxation
B.A. 1963, University of New Hampshire
J.D. 1966, St. John's University, N.Y.
Charles Wearn Connelly, Jr., Virginia
B.A. 1965, Furman University
J.D. 1968, University of South Carolina
William Alfred Derrick, Jr., District of Columbia
B.A. 1965, John Carroll University
J.D. 1968, Howard University

David Houghton Drohan, Massachusetts
B.A. 1965, College of the Holy Cross
LL.B. 1968, Suffolk University
Paul East, District of Columbia
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Barrister-at-Law 1966, Gray's Inn, London, England
M.B., B.S. 1968, University College Hospital, London, England
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B.A. 1963, Johns Hopkins University
LL.B. 1966, Cornell University
Richard Alan Fogel, Maryland
Taxation
B.B.A. 1963, LL.B. 1966, University of Texas at Austin
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B.S. in B.A. 1961, Bucknell University
LL.B. 1964, Dickinson School of Law
David Foss Garrison, District of Columbia
B.A. 1965, Amherst College
J.D. 1968, George Washington University
Francis Atwood Gilligan, New York
B.A. 1961, Alfred University
J.D. 1964, State University of New York at Buffalo
Thomas Flaherty Ging, Virginia
B.A. 1963, John Carroll University
LL.B. 1966, Georgetown University

- Richard Theodore Goldberg, Maryland
Taxation
B.S.E. 1963, University of Pennsylvania
J.D. 1966, University of Pittsburgh
- Martin Peter Hartman, District of
Columbia
Public International and
Comparative Law
B.A. 1958, B.S.(E.E.) 1959, Columbia
University
J.D. 1964, Georgetown University
- Musan Jane Hendershott, District of
Columbia
Taxation
LL.B. 1950, B.B.A. 1966, George
Washington University
- Andrew Steele Horton, Virginia
B.A. 1941, Lafayette College
LL.B. 1948, University of Virginia
- Truce Howard Johnsonbaugh, California
B.S. 1963, J.D. 1966, University of
California, Los Angeles
- William Henry Clay Keen, Pennsylvania
Labor Law
Ph.B. 1944, Dickinson College
LL.B. 1949, Dickinson School of Law
- Mark Howard Kovey, District of
Columbia
B.A. 1964, Columbia University
J.D. 1967, New York University
- Stephen Irwin Lingenfelter, District of
Columbia
(With Highest Honors)
B.A. 1965, Texas Christian University
J.D. 1969, University of Texas at
Austin
- Patrick Francis John Macrory, District of
Columbia
(With Highest Honors)
B.A., M.A. 1968, Oxford University,
England
- Richard Hubert ManFreda, District of
Columbia
B.S. in B.A. 1963, Georgetown
University
J.D. 1966, American University
- John Francis Mee, Massachusetts
B.A. 1965, College of the Holy Cross
LL.B. 1968, Suffolk University
- James Clyde Morfitt, Idaho
Taxation
B.A. 1963, J.D. 1966, University of
Idaho
- Donald Hugh Mullins, Virginia
B.S. 1965, Iowa State University of
Science and Technology
J.D. 1967, University of Tennessee
- Stephen Alan Nauheim, Virginia
Taxation
B.S. 1964, University of North Carolina
at Chapel Hill
J.D. 1967, Georgetown University
- Richard Alan Oshins, Maryland
Taxation
B.S. 1963, American University
J.D. 1966, St. John's University, N.Y.
M.B.A. 1968, University of California,
Berkeley
- John Stanley Pachter, Virginia
Government Procurement Law
B.A. 1963, Tulane University of
Louisiana
LL.B. 1966, George Washington
University
- Paul Pineo, Jr., Virginia
Taxation
B.A. 1963, Colby College
J.D. 1967, Georgetown University
- John Charles Ranney, Virginia
B.A. 1952, College of the Holy Cross
LL.B. 1957, Georgetown University
- Thomas Richard Sanftner, Florida
Taxation
B.A. 1962, J.D. 1964, University of
Iowa
- David Shor, New Jersey
B.A. 1965, New York University
LL.B. 1968, Boston University
- John Clay Smith, Jr., District of Columbia
Labor Law
B.A. 1964, Creighton University
J.D. 1967, Howard University
- Frederick Edward Wallach, Maryland
Taxation
B.A. 1959, Williams College
J.D. 1962, Harvard University
- Paul Francis Wenker, Virginia
Taxation
B.S. 1964, Xavier University, Ohio
J.D. 1967, Georgetown University

MASTER OF COMPARATIVE LAW

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Rechtsreferendar 1968, Bayer.
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MASTER OF COMPARATIVE LAW (American Practice)

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 B.S. in B.A. 1952, Florida Southern
 College
 Doctor of Social Sciences and Public
 Law 1959, University of Havana, Cuba

DOCTOR OF JURIDICAL SCIENCE

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International Law

Dissertation: *The Relationship between Saudi Arabian Domestic Law and International Law: A Study of the Oil Agreements with Foreign Companies*

Licence en Droit 1961, Cairo University, Egypt

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International Law

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LL.B. 1960, University of Athens, Greece

SCHOOL OF ENGINEERING AND APPLIED SCIENCE

BACHELOR OF SCIENCE (Civil Engineering)

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Dennis Gene Gallino, Pennsylvania

BACHELOR OF SCIENCE (Electrical Engineering)

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Jacob Marshall Azrael, Maryland

James Benjamin Bladen, Virginia

(Special Honors)

James Boland, District of Columbia

Jack Frederick Dahlin, Maryland

John Clay Davies III, Virginia

Alfred Samuel DeLuca, Jr., Delaware

Alan Swaine Dohne, Maryland

Richard Otto Griesel, Virginia

Paul Metz Haldeman, Jr., Virginia

(With Distinction)

Mohammed Hassan Hatoum, Lebanon

John Michael Horstkamp, Jr., Virginia

Pradeep Prithvi Kaul, District of
 Columbia

Klaus Joachim Kerl, District of Columbia

John Alexander Lundin, Maryland

George Morris Mathews III, District of
 Columbia

John Michael McCunniff, District of
 Columbia

Carroll Arnn Potter, New Jersey

Robert Duane Sadler, Virginia

Sukumar Sain, India

William Martin Strasburg, Jr., Virginia

BACHELOR OF SCIENCE (Mechanical Engineering)

Ibrahim Aborsey Ashie, District of
 Columbia

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 Maryland

Kenneth Vincent Hum, Maryland

Stephen Michael Tenney, Virginia

MASTER OF ENGINEERING ADMINISTRATION

- Stewart Baily, Virginia
 B.S. 1960, Pennsylvania State University
 George Matthew Bartman, Maryland
 B.S. 1964, Rutgers, the State University
 Billy Gray Bass, Maryland
 B.Nuclear Engr. 1958, North Carolina State University at Raleigh
 Ronald Melvin Brave, Virginia
 B.S.E. 1964, University of Maryland
 John Andrew Christians, Virginia
 Petroleum Engineer 1958, Colorado School of Mines
 Walter James Crater, Jr., Virginia
 B.S. 1961, Washington and Lee University
 B.E.E. 1965, George Washington University
 Robert Anthony Fucetola, Maryland
 B.S. in E.E. 1964, Newark College of Engineering
 Charles Joseph Gaylord, District of Columbia
 M.C.E. 1951, Technical University of Budapest, Hungary
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 B.S. 1957, Kansas State University of Agriculture and Applied Science
 B.S. 1958, Pennsylvania State University
 Harry Anthony Goldberg, Maryland
 B.E.E. 1959, Villanova University
 Richard David Gordon, Maryland
 B.S. in C.E. 1966, University of Maryland
 David James Graham, Maryland
 B.S. in E.E. 1959, M.S. in E.E. 1965, Drexel Institute of Technology
 Thomas Henry Jackson, Maryland
 B.S. in E.E. 1967, University of Pennsylvania
 Paul Douglas King, Maryland
 B.S. in M.E. 1956, Duke University
 Philip Edward Loiterstein, District of Columbia
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 B.S. in E.E. 1967, Virginia Polytechnic Institute
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 B.M.E. 1962, Catholic University of America
 George Joseph Morzinski, Virginia
 B.S.(E.E.) 1962, University of Colorado
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 B.S. in M.E. 1965, Carnegie-Mellon University
 Oscar James Remson, Maryland
 B.S. 1951, University of Maryland
 Angelo Michael Ricciardelli, Virginia
 B.S. in E.E. 1930, Massachusetts Institute of Technology
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 William Porter Short, Virginia
 B.S.E. 1957, Johns Hopkins University
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 B.A. 1962, Baldwin-Wallace College
 B.S. in E.E. 1962, Columbia University
 Thomas Jenner Smyth, Virginia
 B.S. in E.E. 1958, Virginia Military Institute
 B.S. 1964, U.S. Naval Postgraduate School
 Francis Michael Sovaiko, Maryland
 B.E.E. 1959, University of Delaware
 Winston Brent Springford, New York
 B.S. in M.E. 1964, University of Idaho
 Leigh Joel Waxman, Maryland
 B.E.E. 1964, Rensselaer Polytechnic Institute
 James William Workman, Virginia
 B.S. in E.E. 1966, Virginia Polytechnic Institute
 Donald Edward Young, Maryland
 B.S. in E.E. 1966, Northeastern University

MASTER OF SCIENCE

- Martin Eric Adler, Maryland
Communications
B.S. in E.E. 1967, University of Maryland
- Gerald Richard Baus, Maryland
Communications
B.S. in E.E. 1966, Drexel Institute of Technology
- John Robert Benton, Virginia
Computer Science
B.S. in E.E. 1965, University of New Mexico
- Richard Paul Bertram, Virginia
Communications
B.S. in E.E. 1961, University of Pittsburgh
- Richard Lee Borders, Maryland
Computer Science
B.S. in E.E. 1968, Drexel Institute of Technology
- Susan Martin Burrowbridge, Maryland
Computer Science
B.S. 1966, University of Richmond
- Eldon Arthur Byrd, Maryland
Medical Engineering
B.S. in E.E. 1961, Purdue University
- Francis Michael Cevasco, Jr., Maryland
Structural Engineering
B.S. in C.E. 1963, Polytechnic Institute of Brooklyn
- Jeff Ira Cleveland II, Virginia
Computer Science
B.S. in E.E. 1963, Texas A&I University
- Bülent Belig Ertumen, District of Columbia
Structural Engineering
B.S. in C.E. 1963, Robert College, Turkey
- Hyman Abraham Feldstein, Texas
Solid Mechanics
B.E. 1963, City College, New York
- Kenneth Eugene Geisinger, Maryland
Operations Research
B.S. 1960, Bluffton College
- Dennis Matthews Giblin, Maryland
Computer Science
B.S. 1966, Boston College
- Alan Richard Goldey, Maryland
Solid Mechanics
B.S. 1967, Arizona State University
- Leonard Norman Gottfried, Maryland
Communications
B.E.E. 1967, City College, New York
- Bruce Milford Kendall, Virginia
Fields and Waves
B.S. in E.E. 1960, Virginia Polytechnic Institute
- Lawrence Raymond Kilty, District of Columbia
Communications
B.S. 1954, U.S. Naval Academy
B.S. 1967, U.S. Naval Postgraduate School
- Richard Warren Kuberry, Virginia
Measurement Science
B.A. 1953, LaSalle College
- Alan Myron Letow, Maryland
Operations Research
B.M.E. 1957, City College, New York
- Robert Joseph Maichle, Maryland
Networks
B.S. (Communications) 1965, George Washington University
- Ira Reuben Marcus, Maryland
Computer Science
B.S. 1954, Brooklyn College
- Neill James McKay, Maryland
Communications
B.S. in E.E. 1961, Newark College of Engineering
- Charles George Miller III, Virginia
Fluid Mechanics
B.S. 1962, Tennessee Technological University
- William Brenton Noé, Virginia
Fluid Mechanics
B.S. in M.E. 1954, Massachusetts Institute of Technology
- Angel Luis Padilla, Alabama
Measurement Science
B.S. in E.E. 1964, Indiana Institute of Technology
- John Thomas Redmond, Maryland
Networks
B.S. in E.E. 1968, Northeastern University
- Terence Glenn Ryan, Maryland
Fields and Waves
B.S. 1963, Worcester Polytechnic Institute
- Walter Carroll Scales, Maryland
Communications
B.S. (Communications) 1967, George Washington University
- Pierre Marshall Tullier, California
Operations Research
B.S. 1967, Georgetown University

MASTER OF SCIENCE IN ENGINEERING

Frederick Roland Henrikson, Virginia
B.S. in E.E. 1953, Northeastern
University

DOCTOR OF SCIENCE

- Moyett Talmadge Clark, District of Columbia
Communications
Dissertation: *Word Recognition by Means of Orthogonal Functions*
B.S. in E.E. 1961, Howard University
M.S. in E.E. 1965, Drexel Institute of Technology
Ronald Arthur Finkler, District of Columbia
Communications
Dissertation: *The Estimation of Signal-to-noise Ratio for Real and Analytic Signals and Gaussian Noise*
B.E.E. 1951, M.E.E. 1954, New York University
David Hardy Nelson, Maryland
Networks
Dissertation: *State-space Realization of Transfer Function Matrices*
B.S. in E.E. 1957, University of California, Berkeley
M.S. in Engr. 1962, George Washington University
Weldon Richard Vlasak, Florida
Networks
Dissertation: *Time-Variant Filter Synthesis*
B.S. in E.E. 1954, University of Nebraska
M.S. 1958, University of Arizona

SCHOOL OF EDUCATION

BACHELOR OF ARTS IN EDUCATION

- | | |
|--|---|
| Gail Susan Baum, Connecticut
Elementary Education | Vicky Lee Covey Clark, Maryland
Elementary Education
(With Distinction) |
| Louise Ann Berman, Virginia
Elementary Education | Beth Ann Cohen, New York
Elementary Education |
| Judy Louise Blum, New York
Elementary Education | Sharon Zelda Cohen, New Jersey
English |
| Judy Ann Boesch, Virginia
English | Mary Jacqueline Davis, New York
Elementary Education |
| Elaine Susan Boraks, Massachusetts
Mathematics | Madeleine Hill Deming, District of
Columbia
Elementary Education |
| Hillary Louise Broder, New York
Social Studies | John Guy Deputy, Jr., Virginia
History |
| Carol Anne Brodie, New York
Mathematics | Stacey Joy Dorris, Massachusetts
Elementary Education |
| Maureen Edith Brown, District of
Columbia
Elementary Education | Arthur Ronald Goldman, Pennsylvania
Social Studies |
| Olinda Dormaier Brown, Virginia
Business Education | Cheryl Marlene Goldstein, New Jersey
Elementary Education |
| Bonnie Lynn Chirlin, Virginia
English | |

- Sandra Eileen Goodman, Connecticut
Elementary Education
- Deborah Judith Grossman, Maryland
Elementary Education
- Jane Dickens Henderson, Pennsylvania
Elementary Education
- Sheila Hershkowitz, New Jersey
History
- Swananoa Parker Hill, Maryland
Geography
- Kathleen Flaherty Holcombe, Virginia
English (With Distinction)
- Susan Ellen House, New York
Elementary Education
- Carol Lee Huey, Virginia
Elementary Education
(With Distinction)
- Evelyn Charlotte Huwyler, New Jersey
Spanish (With Distinction)
- Roseanne Theresa Ianco, New Jersey
Elementary Education
- Maris McCloskey Johnson, Virginia
Art
- Jacquelyn Janet Kalhammer, Virginia
Elementary Education
- Karen Faith Kuker, New Jersey
Elementary Education
- Arlene Marsha Lehrer, New Jersey
Elementary Education
- Susan Dee Levin, New Jersey
Elementary Education
- Deena Levine, Pennsylvania
English
- Barbara Ruth Lewis, Delaware
Social Studies
- Victoria Ann Loeffler, Pennsylvania
Elementary Education
- Ellen Janet Ludwig, District of Columbia
Elementary Education
- Lynne Ruth Margonelli, Connecticut
Elementary Education
(With Distinction)
- Robert Angelo Mazzoni, Pennsylvania
Social Studies
- Laurel Naomi Milcoff, Ohio
Social Studies
- Carol Gail Miller, Pennsylvania
History
- Judith Moer, District of Columbia
French
- Judith Anne Naumann, New York
Social Studies
- Diane Marie Newcity, Maryland
Elementary Education
- Lois Janet Ouellette, Connecticut
Elementary Education
- Linda Paley, Rhode Island
Elementary Education
- Linda Ruth Peller, Maryland
Mathematics
- Sylvia Joyce Perucci, Virginia
Elementary Education
- Rénee Eileen Pulver, New York
Elementary Education
- Barbara Jane Raco, New Jersey
Social Studies
- Cynthia Ann Reiss, New York
Art
- Karen Chance Rogg, District of Columbia
Art (With Distinction)
- Carol Ann Rosen, District of Columbia
Elementary Education
- Karen Lynn Roth, New York
Elementary Education
- Nancy Laura Rothschild, New York
Social Studies
- Ellen Diane Saunders, Virginia
Chemistry
- Carol Ann Schlager, Virginia
Elementary Education
- Susan Ann Scholl, Illinois
Elementary Education
- Marjorie Sue Shames, Delaware
Elementary Education
- Nora Lynn Silver, Connecticut
Spanish
- William Edward Sims, Jr., Maryland
Social Studies
- Peggy Ann Sinberg, Pennsylvania
Elementary Education
- Marianne Solomon, New York
Elementary Education
- Kathy Sue Sorkin, New Jersey
English
- Ronnie Gay Spieler, New Jersey
Spanish
- DeEtta Faye Stein, Virginia
Spanish
- Joan Helene Suchman, New York
Social Studies
- Harriet Carol Svirsky, New York
Speech and Drama
- Rhonda Sharon Tenenbaum, Georgia
Elementary Education
- Margaret Webster Ten Eyck, Maryland
English
- Andrea Sue Tilkin, Massachusetts
Elementary Education
- Hanna Zofia Truszczynski, New Jersey
French
- Michael Paul Waterman, Nebraska
Elementary Education

Lois Jill Weiner, New York
Elementary Education
Ellen Denise Wiener, New York
Elementary Education
Susan Ann Wiener, New York
French
Sheila Irene Weinstein, New Jersey
Elementary Education

Joan Beth Yarmovsky, New Jersey
Elementary Education
Gordon Kenneth Young, Virginia
Social Studies
Suzanne Jane Zipple, Michigan
Art

BACHELOR OF SCIENCE IN PHYSICAL EDUCATION

Margaret Louise Bialla, Virginia
Robert Wright Dennis, Virginia
Vincent Peter Krevinas, Pennsylvania

Steven James Loveless, Virginia
Chris Earl Petersen, Maryland
Ronne Ann Rogin, New York

MASTER OF ARTS IN EDUCATION

William Howard Abell, Virginia
Physical Education
B.S. 1960, Shepherd College
Carol Susan Abrams, District of
Columbia
Elementary Education
B.A. 1970, Temple University
James Paul Akin, Virginia
Secondary Education
B.A. 1958, M.A. 1959, University of
Kentucky
Patricia Ann Alley, Maryland
Secondary Administration
B.A. in Ed. 1964, George Washington
University
Marie Baltimore Anderson, Maryland
Reading
B.S. 1950, District of Columbia
Teachers College
Matthew Arbutina, Maryland
Physical Education
B.S. 1967, University of Maryland
Anna Einsiedler Auerbach, Virginia
Reading
B.A. 1959, Montclair State College
Veronica Therese Ball, District of
Columbia
Special Education
B.S. 1966, District of Columbia
Teachers College
Maria Elizabeth Barbieri, New York
Special Education
B.A. 1968, College of Mount Saint
Vincent
Doris Jean Morgenthal Becker, Virginia
Higher Education
B.A. in Ed. 1961, George Washington
University

Whyla Kay Beman, District of Columbia
Special Education
B.A. 1960, Luther College
Jill Kulick Berman, New York
Secondary Education
B.A. 1968, George Washington
University
Peter Jay Berman, District of Columbia
Rehabilitation Counseling
B.A. 1968, George Washington
University
Harry William Alvin Biehl, Virginia
Adult Education
B.A. 1950, University of Maryland
Geraldine Exum Blount, District of
Columbia
Elementary Education
B.S. 1944, North Carolina Agricultural
and Technical State University
Barbara Elizabeth Boyle, Maryland
Special Education
B.S. 1968, Frostburg State College
Joan Helene Boysen, Virginia
Elementary Education
B.A. 1960, College of William and
Mary
Harold Koatz Burchette, Jr. Maryland
Physical Education
B.S. in P.E. 1965, George Washington
University
Ovid McMaster Butler, Virginia
Secondary Education
B.S. 1936, U.S. Naval Academy
Marylouise Jones Callahan, Maryland
Elementary Administration
B.A. 1949, Temple University
Charles Richard Campbell, Virginia
Physical Education
B.S. in P.E. 1969, George Washington
University

- Robert Eugene Carey, Maryland
Guidance
B.S. 1963, Tennessee Technological University
- Kathleen Scheel Carter, Virginia
Secondary Education
B.A. in Ed. 1968, George Washington University
- Joy Wright Chance, Virginia
Special Education
B.A. 1943, University of Michigan
- James Louis Chase, Maryland
Elementary Administration
B.S. 1959, Bowie State College
- Frances Nadelman Chyatte, Maryland
Guidance
B.S. 1957, Towson State College
- Max Cohen, Virginia
Secondary Education
B.S. 1956, District of Columbia Teachers College
- Thomas Clinton Collier, District of Columbia
Special Education
B.Mus.Ed. 1950, Howard University
- Catherine Lee Cooper, Maryland
Secondary Education
B.S. 1963, North Carolina Agricultural and Technical State University
- Corinne Catherine Custis, District of Columbia
Reading
Ed.B. 1968, University of Miami
- Leila Holman Davies, District of Columbia
Elementary Education
B.S. 1958, Fort Valley State College
- Joan Harriet Denton, Virginia
Guidance
B.S. 1955, University of Maryland
- Gilda Beliveau Dick, Virginia
Special Education
B.A. 1968, Marymount College, N.Y.
- Minnie Best Durante, Virginia
Reading
B.S. 1957, Hampton Institute
- Joan Mary Ellis, District of Columbia
Special Education
B.A. 1968, Rosemont College
- Philip Barry Epstein, Virginia
Rehabilitation Counseling
B.A. 1968, George Washington University
- Joan Karen Ferguson, Virginia
Elementary Education
B.A. 1965, Randolph-Macon Woman's College
- Jatis Juan Franklin, District of Columbia
Special Education
B.S. 1960, Southern University and Agricultural and Mechanical College
- Susan Marie Freienmuth, Maryland
Elementary Education
B.A. 1966, Ohio Wesleyan University
- Cynthia Harriet Gerst, District of Columbia
Rehabilitation Counseling
B.A. 1968, George Washington University
- Grace Beer Goldstein, Maryland
Reading
B.S. 1958, District of Columbia Teachers College
- Pennington Sylvester Greene, District of Columbia
Reading
B.A. 1958, Howard University
- Sheila Ellen Greller, District of Columbia
Special Education
B.A. 1969, George Washington University
- Rosetta Brooks Hairston, Maryland
Elementary Education
B.S. 1962, St. Paul's College, Va.
- Norman Edward Hall, District of Columbia
Employee Development
B.A. 1950, Brown University
- Robert Eugene Hampton, Maryland
Physical Education
B.S. 1966, Montana State University
- Jane Jackson Harley, District of Columbia
Guidance
B.S. 1960, District of Columbia Teachers College
- Ruth Mae Harris, Maryland
Rehabilitation Counseling
B.S. 1958, Loma Linda University
- Norman Leroy Hatfield, Missouri
Secondary Education
B.S. 1964, University of Maryland
- Maureen Elizabeth Hawko, Massachusetts
Reading
B.S. 1969, State College at Salem
- Judith Marion Hirsch, Connecticut
Special Education
B.S. 1969, Southern Connecticut State College
- Helen Wilkinson Holmes, District of Columbia
Special Education
B.S. 1945, District of Columbia Teachers College

- Gail Belaga Horwitz, Maryland
Special Education
B.S. 1963, University of Maryland
- Hugo Gustav Huettig III, Maryland
Secondary Education
B.S. in Engr. 1960, Princeton University
- Richard Joseph Indelicato, Virginia
Adult Education
B.S. in B.A. 1956, Boston University
M.A. 1963, George Washington University
- Elinor Wilson Ingram, District of Columbia
Special Education
B.A. in Ed. 1969, George Washington University
- Bella Hertzberg Jacobs, Maryland
Rehabilitation Counseling
B.A. 1940, Westhampton College
- Roger Graham James, Louisiana
Special Education
B.A. 1965, Louisiana State University
- Audrey Lorraine Jones, District of Columbia
Special Education
B.A. 1949, West Virginia State College
- Eleanor Sue Judd, District of Columbia
Guidance
B.A. 1965, Queens College, N.C.
- Ruth Talbott Keimig, Virginia
Reading
B.A. 1954, Goucher College
- Leila Killen Kight, District of Columbia
Student Personnel Work in Higher Education
B.A. 1968, Chapman College
- Gilbert Lee King, Jr., Virginia
Physical Education
B.S. 1963, Virginia Commonwealth University
- James Dale Kirkland, District of Columbia
Secondary Administration
B.S. in Ed. 1961, Kent State University
- Levoner Frankie Lake, District of Columbia
Guidance
B.S. 1968, District of Columbia Teachers College
- Jeannette De Rome Lapp, Virginia
Secondary Education
B.A. 1950, University of New Hampshire
- David Wilson Lawrence, Virginia
Student Personnel Work in Higher Education
B.A. 1964, Miami University
- Cleopatra Hargett Lawton, District of Columbia
Special Education
B.S. 1964, Livingstone College
- Orelia Washington Ledbetter, District of Columbia
Special Education
B.A. 1936, Tillotson College
B.S. in Ed. 1953, Southern Connecticut State College
- Mattie Beamon Lee, District of Columbia
Elementary Education
B.A. 1951, Howard University
- David John Lesage, District of Columbia
Adult Education
B.A. 1960, Assumption College, Mass.
- Eleanor Roy Alton Levi, Virginia
Special Education
B.S. 1961, Boston University
- Ellen Weber Libby, District of Columbia
Rehabilitation Counseling
B.A. 1967, George Washington University
- Johnnella Logan Lipscomb, District of Columbia
Elementary Administration
B.S. 1964, District of Columbia Teachers College
- Charles Bernard Lyles, District of Columbia
Special Education
B.S. 1959, District of Columbia Teachers College
- Judy Pauline Mannes, District of Columbia
Special Education
B.A. 1968, George Washington University
- Rose Murla Mathews, District of Columbia
Reading
B.A. 1965, District of Columbia Teachers College
- Edward Martin McDonald, Maryland
Physical Education
B.S. in Ed. 1964, California State College, Pa.
- Sheila Tilghman Milbourne, Maryland
Elementary Administration
B.S. 1960, District of Columbia Teachers College
- Kathleen McComb Miller, Virginia
Special Education
B.A. 1963, Denison University

- Marc Anthony Moore, Virginia
Student Personnel Work in Higher Education
B.A. 1951, Southern Methodist University
- Virginia Dare Moore, Virginia
Adult Education
B.S. 1948, Shaw University
M.A. 1952, New York University
- James Andrew Morris, New Jersey
Rehabilitation Counseling
B.S. in Phil. 1968, St. Peter's College, N.J.
- Claude Edwin Moten, Maryland
Secondary Administration
B.A. 1961, Pennsylvania State University
- Sarah Elizabeth Moten, Maryland
Guidance
B.A. 1964, Hampton Institute
- Robert Monroe Myers, Maryland
Secondary Administration
B.S. in Ed. 1964, Kent State University
- Florence Reynolds Nikkel, Virginia
Special Education
B.A. 1963, Trinity College, D.C.
- Patricia Jean Olson, Virginia
Early Childhood Education
B.A. 1963, University of Maryland
- Rosita Purvis Owens, Maryland
Rehabilitation Counseling
B.S. 1967, Howard University
- Carlene Louise Parker, Virginia
Adult Education
B.A. 1954, George Washington University
- Marilyn Ronni Parker, Virginia
Special Education
B.S. 1968, Syracuse University
- Mary Irene Pendell, District of Columbia
Adult Education
B.S. 1954, Marquette University
- John Phillips, Rhode Island
Student Personnel Work in Higher Education
B.S. 1952, Boston University
- Eileen Ann Piercy, District of Columbia
Secondary Education
B.A. 1967, University of Maryland
- Ancil Roosevelt Potter, Maryland
Elementary Administration
B.A. 1963, Howard University
- Bernadette Kathleen Quinn, District of Columbia
Special Education
B.A. 1965, St. Mary's College, Ind.
- Thomas Eugene Reilly, Virginia
Special Education
B.S. in P.E. 1967, George Washington University
- Robert Joseph Robyak, Virginia
Physical Education
Ed.B. 1966, Washburn University of Topeka
- Ellen Muriel Rosenbaum, New York
Special Education
B.A. 1968, Brooklyn College
- Kathleen Yolanda Ryan, Virginia
Secondary Education
B.A. 1968, William Smith College
- Lillie Fuller Sampson, District of Columbia
Special Education
B.S. 1957, District of Columbia Teachers College
- Lynn Deborah Saunders, Nebraska
Elementary Education
B.S. 1969, University of Nebraska
- Judith Margaret Schmidt, Maryland
Early Childhood Education
B.A. in Ed. 1969, George Washington University
- John Barrett Schultz, District of Columbia
Adult Education
B.A. 1955, Stonehill College
M.A. in Rel. 1960, Immaculate Conception Seminary
- Kenneth Theodore Secrist, District of Columbia
Secondary Education
B.A. 1966, Carson-Newman College
- Iris Linda Sexter, District of Columbia
Rehabilitation Counseling
B.A. 1964, Brooklyn College
- Elizabeth Ann Sheldon, Virginia
Secondary Education
B.S. 1963, Illinois State University
- Sidney Abraham Shore, Virginia
Special Education
B.S. 1965, District of Columbia Teachers College
- Arnold Paul Siegfried, Virginia
Physical Education
B.S. in Ed. 1941, Rutgers, the State University
- Constance Ann Singleterry, Canada
Elementary Administration
B.A. 1955, Aurora College
- Sarah Sims Smith, District of Columbia
Guidance
B.S. 1957, Winston-Salem State College

- Stanley Sherrel Smith, District of
Columbia
Philosophy of Education
B.A. 1962, George Washington
University
- William Parkhurst Smith, Jr., Maryland
Higher Education
B.A. in Govt. 1953, M.B.A. 1961,
George Washington University
- Nancy Joan Sobel, Maryland
Special Education
B.S. 1966, University of Michigan
- Ancil Blanton Sparks, Virginia
Physical Education
B.S. in Ed. 1967, Concord College
- Raymond Henderson Spuhler, Virginia
Physical Education
B.A. 1942, Duke University
Ed.M. 1966, University of Virginia
- Jane Legare Stecher, District of Columbia
Student Personnel Work in Higher
Education
B.S. 1969, University of Florida
- Susan Warshaw Stinson, Texas
Physical Education
B.A. 1968, Hood College
- Eloise Trice Storm, Maryland
Elementary Education
B.S. 1960, Towson State College
- Minako Sudo, Japan
Secondary Education
B.A. 1953, Tsuda College, Japan
- Charles Michael Sullivan, Maryland
Physical Education
B.S. 1967, University of Maryland
- Noel Gene Thornburg, District of
Columbia
Special Education
B.S. in Ed. 1957, Ball State University
- David Michael Tunkaly, Pennsylvania
Rehabilitation Counseling
B.A. 1967, College of Steubenville
- Elizabeth Kelsey Vanden Heuvel, District
of Columbia
Special Education
B.S. 1962, University of Maryland
- Laura Solomon Vault, District of
Columbia
Reading
B.A. 1956, Talladega College
- Susan Lee Voss, District of Columbia
Reading
B.A. in Ed. 1968, George Washington
University
- Mary Elizabeth Murphy Ward, Virginia
Special Education
B.A. 1968, Trinity College, D.C.
- Cora Haden Watlington, Virginia
Physical Education
B.S. 1963, Madison College
- William Milton Weaver, Virginia
Secondary Administration
B.S. in P.E. 1956, George Washington
University
- Loretta Crawford Webb, Maryland
Elementary Administration
B.S. 1956, District of Columbia
Teachers College
- Mary Anne Whited, Virginia
Physical Education
B.S. 1962, West Chester State College
- Earl Howard Williams, Maryland
Adult Education
B.A. 1949, Catholic University of
America
- Sheila Margaret Williams, District of
Columbia
Rehabilitation Counseling
B.A. 1968, Trinity College, D.C.
- Blanche Robinson Wilson, District of
Columbia
Reading
B.S. 1948, Bowie State College
- Grazia Kate Wilson, Florida
Student Personnel Work in Higher
Education
B.A. 1965, American University
- Jean Godfrey Wittig, District of
Columbia
Special Education
B.A. 1966, Duke University
- Laurie Yap Wong, Maryland
Secondary Education
B.Ed. 1968, University of Hawaii
- Lauretta Jean Wright, New Jersey
Special Education
B.S. 1969, Morgan State College
- Janyce Tamiye Yoshizawa, District of
Columbia
Elementary Education
B.A. in Ed. 1959, George Washington
University
- Hattie Whitehead Young, District of
Columbia
Reading
B.S. 1960, District of Columbia
Teachers College

MASTER OF ARTS IN TEACHING

- Vernelle Brenda Ball, District of Columbia
Elementary Education
B.A. 1969, Trinity College, D.C.
- Kathryn Wold Bean, Virginia
Elementary Education
B.A. 1951, Stanford University
- Eleanor Price Berman, Maryland
Elementary Education
B.S. 1948, Syracuse University
- Winona Kim Blackburn, District of Columbia
Elementary Education
B.A. 1962, Columbia University
- Ellen Ann Brock, District of Columbia
Elementary Education
B.A. 1968, University of California, Berkeley
- Bonnie Mae Carter, Virginia
Elementary Education
B.A. 1958, University of Hawaii
- Marcia Cronan, Maryland
Elementary Education
B.A. 1965, Dunbarton College of Holy Cross
- Fern Feinberg, District of Columbia
Elementary Education
B.A. 1967, Temple University
- Laurie Handlers, New York
Elementary Education
B.A. 1969, George Washington University
- Deborah Wilson Horn, Maryland
Elementary Education
B.A. 1969, Oberlin College
- Julie Ann Jaeger, Virginia
Elementary Education
B.A. 1968, University of California, Berkeley
- Elizabeth Kinney Jones, Maryland
Elementary Education
B.A. 1944, Bates College
- Frances Susan Kaiser, New Jersey
Elementary Education
B.A. 1968, George Washington University
- Nancy Wiser Kocher, Virginia
Elementary Education
B.A. 1957, Stanford University
- Elaine Patricia LoForte, Maryland
Elementary Education
B.S. 1969, University of Connecticut
- Glenn Kenneth Maxwell, Virginia
Elementary Education
B.Gen.Std. 1968, University of Nebraska
- Carolyn Jo Miller, District of Columbia
Elementary Education
B.A. 1969, Scripps College
- Margaret Frances Mount, Maryland
Elementary Education
B.A. 1969, College of New Rochelle
- Susan Sideman Norwitch, Virginia
Elementary Education
B.S. 1954, Northwestern University
- Rita Iris Perlman, New Jersey
Elementary Education
B.A. 1969, Rutgers, the State University
- Stuart Moss Porter, Virginia
Elementary Education
B.S. in B.A. 1938, University of Oklahoma
- M.A. 1949, University of Minnesota
M.A. in I.A. 1964, George Washington University
- Elisabeth Davis Ransom, Virginia
Elementary Education
B.S. 1944, Mary Washington College of the University of Virginia
- Elizabeth Wallace Redmond, Maryland
Elementary Education
B.A. in Govt. 1958, George Washington University
- Elizabeth Byrem Robbins, Maryland
Elementary Education
B.S. 1954, Pennsylvania State University
- Ruth Adams Rogers, District of Columbia
Elementary Education
B.A. 1969, George Washington University
- Rosanne Teresa Skinner, District of Columbia
Elementary Education
B.A. 1968, University of Portland
- Ina Aronoff Smith, Maryland
Elementary Education
B.A. 1961, University of Illinois
- Robert William Steinmetz, District of Columbia
Elementary Education
B.A. 1969, University of Notre Dame
- Linda Kay Taylor, Virginia
Elementary Education
B.A. 1967, Michigan State University
- Doris Sommer Wetherbee, Virginia
Elementary Education
B.A. 1967, University of Maryland

EDUCATION SPECIALIST

- Charles Eugene Akard, Tennessee
Adult Education
B.S. 1942, Milligan College
M.A. 1950, George Peabody College
for Teachers
B.S. 1960, U.S. Naval Postgraduate
School
- Gerald Bernard Boyd, Maryland
Early Childhood Education
B.S. 1963, District of Columbia
Teachers College
M.A. 1967, Howard University
- Charles Carroll Cockrell, Maryland
Administration and Supervision
B.A. 1964, Ed.M. 1967, University of
Maryland
- John Francis Falcone, District of
Columbia
Special Education
B.A. 1953, Saint Mary's Seminary and
University
M.A. in Ed. 1968, George Washington
University
- Amelia Kolk Haile, Virginia
Guidance
B.S. 1939, Johns Hopkins University
M.A. in Ed. 1953, George Washington
University
- Carol Watson Heiderman, Virginia
Elementary Administration
B.A. in Ed. 1961, George Washington
University
Ed.M. 1968, American University
- James Merwyn Hill, Virginia
Guidance
B.S. in P.E. 1956, M.A. in Ed. 1959,
George Washington University
- Alan Robert Kacsur, Maryland
Adult Education
B.S. 1951, Albright College
Ed.M. 1959, Temple University
- Luther Mitchell McManus, Jr., District
of Columbia
Guidance
B.S. 1943, District of Columbia
Teachers College
M.A. 1963, Marshall University
- Pamela Ruth Murray, District of
Columbia
Special Education
B.A. 1968, Boston College
M.A. in Ed. 1969, George Washington
University

DOCTOR OF EDUCATION

- Francis Vincent Corrigan, Jr., District of Columbia
Guidance and Counseling
Dissertation: *A Comparison of Self Concepts of American Indian Students
from Public or Federal School Backgrounds*
B.A. 1959, Providence College
Ed.M. 1961, Boston University
- Fern Alvin Goss, Maryland
Administration and Supervision
Dissertation: *A Synthesized Concept of Community Junior College Educational
Business Administration in Times of Transition for Institutions Exceeding
1,000 Student Enrollment*
B.S. in Ed. 1958, Bloomsburg State College
Ed.M. 1964, State University of New York at Buffalo
- Allie Banks Henry, Virginia
Curriculum
Dissertation: *Critical Requirements at the Job-entry Level for Graduates of the
Public Secondary School Vocational Programs of the State of Virginia*
B.A. 1954, M.A. 1957, Marshall University
A.P.C. 1963, George Washington University
- Stephen Joseph Korcheck, Maryland
Teacher Education
Dissertation: *A Historical Study of the Origin and Development of the Physi-
cal Education Major Field Program at The George Washington University*
B.S. in P.E. 1954, M.A. in Ed. 1966, George Washington University

Walter Alvin LeBaron III, District of Columbia

Administration and Supervision

Dissertation: *The Education-Industry Planning Consultant: An Emerging Role*

B.A. 1960, State University of New York at Albany

M.A. 1961, University of Colorado

George Nixon, Maryland

Employee Development

Dissertation: *University Instruction in Behavioral Science: Development and*

Testing of an Evaluation Model

B.S. 1949, M.S. 1951, University of Pittsburgh

Charles Bass Reed, Virginia

Teacher Education

Dissertation: *The Doctoral Graduates in Education of The George Washington University, 1960-1970*

B.S. in P.E. 1963, M.A. in Ed. 1964, George Washington University

James Rudolph Sadler, Maryland

Administration and Supervision

Dissertation: *The Involvement of Professional Personnel in Maryland Counties in Planning the 1968-69 Title I Program, and Their Perceived Value of Various Title I Activities*

B.Mus.Ed. 1949, Shenandoah Conservatory of Music

Mus.M. 1950, Northwestern University

Richard Carlton Sloop, Maryland

Teacher Education

Dissertation: *A Descriptive Analysis of the Master of Education Degree Program at the Frostburg State College, Maryland: 1958-1968*

B.S. in Ed. 1955, Madison College

M.A. in Ed. 1958, A.P.C. 1963, George Washington University

Indie Shackelford Turner, New York

Curriculum

Dissertation: *A Study of Teachers' Perceptions of an In-service Education Program in Three Southern Maryland Counties*

B.A. 1952, Mary Washington College of the University of Virginia

Ed.M. 1961, University of Maryland

James Boyd Webb, Virginia

Secondary Administration

Dissertation: *A Comparative Study of the Relation of Broken Homes to the School Success of High School Students*

B.S. 1955, East Carolina University

M.A. in Ed. 1961, George Washington University

SCHOOL OF GOVERNMENT AND BUSINESS ADMINISTRATION

BACHELOR OF BUSINESS ADMINISTRATION

Scott Louis Baena, New Jersey

Accounting

Alan Lewis Bortnick, Maryland

Business Administration

John Joseph Bosley III, Pennsylvania

Accounting

Joyce Ann Bradley, District of Columbia

Business Administration

Mark Ronald Bresky, New Jersey

Accounting

William Lee Brickhill, Virginia

Business Administration

Michael Benjamin Brooks, Virginia

Business Administration

Clifton Andrew Brown, Maryland

Business Administration

- Stephen Robert Broyles, California
International Business
- Donald Edward Cohen, Maryland
Business Administration
- William Francis Cupp, Virginia
Accounting
- Joan Anne Davis, New Jersey
Business Administration
(With Distinction)
- Robert Hawley DuLaurence, Ohio
Business Administration
- Richard Frederick Ehmann, Jr.,
New York
International Business
- Rodney Wilcutt Frame, Virginia
Business Administration
- Jerald Alan Freshman, New York
Business Administration
- Peter Conrad Fulweiler, Delaware
Business Administration
- Stephen John Ganslen, New Jersey
International Business
- James Edward Gersing, Maryland
International Business
- Oscar Glenn Goodhand, Virginia
Business Administration
- Leonard Stanley Gordon, Pennsylvania
International Business
- Michael Austin Graybill, South Carolina
Business Administration
- Bradley Gordon Green, Connecticut
Business Administration
- Linda Ann Gunter, Maryland
Business Administration
- Charles Haime, District of Columbia
International Business
- Gregory Bartlett Hall, District of
Columbia
International Business
- Joyce Arlene Hower, Virginia
International Business
- Calvin Eugene James, Virginia
Accounting (With Distinction)
- Estelle Agnes Jones, Maryland
Business Administration
- Mitchel Evan Kallet, Virginia
Business Administration
- Gregory Lee Klein, Virginia
Business Administration
- Milton Jack Labecki, Massachusetts
Accounting
- Sister Johanna Laky, District of
Columbia
Business Administration
- Floyd Hugh Lane, District of Columbia
Accounting
- James William Laughlin, Virginia
Business Administration
- Armand Steven Lesser, Maryland
Business Administration
- Gary Hunter Majors, Maryland
Business Administration
- John Beasley Marler, Iran
International Business
- James Roy McFadyen, New Jersey
Business Administration
- Michael Jeffrey Mera, New York
Business Administration
- Harold Ray Metcalf, Virginia
Business Administration
- Peter Murray, New York
Business Administration
- Howard Rand Norton III, Virginia
Accounting
- Richard Allan Perkins, Maryland
Business Administration
- Donald John Polden, California
Business Administration
- Blanche Giesler Raff, District of
Columbia
Accounting
- George Wallace Ripley III, Connecticut
International Business
- Murray Allen Rosenberg, Connecticut
Business Administration
- Andrew Silverstein, New Jersey
Accounting
- John Richard Snavelly, District of
Columbia
Business Administration
- Naby Soumah, District of Columbia
Business Administration
- Eric Randall Spink, Virginia
Business Administration
- Timothy Muth Stegmaier, Virginia
Business Administration
- Douglas Crane Stiles, Virginia
Business Administration
- John Calvin Thompson, Virginia
Business Administration
- Mark Herbert Todtman, New York
Business Administration
- David Herr Towle, Maryland
Business Administration
- Curtis Edward Whalen, Virginia
Business Administration
- Bruce Douglas White, Virginia
Business Administration
- Jay Dixon White, New York
International Business
(Special Honors)

Michelle Lynn Slagle White, Michigan
Business Administration
(With Distinction)

John Anthony Wrieden, New Jersey
International Business
Julia Zdynak, District of Columbia
Business Administration

BACHELOR OF SCIENCE IN GENERAL STUDIES

Edgar Lee Abbott, Virginia
Business Administration
John Farrell Amesbury, Idaho
Business Administration
Keith Eugene Bailey, Virginia
Business Administration
Paul Maxton Baylor, Virginia
Business Administration
(With Distinction)
Harold Raymond Cody, Virginia
Business Administration
Warren Mason Cone, Virginia
Business Administration
Alvin Eugene Dorman, Virginia
Business Administration
Frank D.R. Fisher, Maryland
Business Administration
George Harrison Fisher, Virginia
Business Administration
Robert Leo Gabler, Maryland
Accounting
Jerry Dean Galbreath, Illinois
Business Administration
Jean Louis Girard, Virginia
Business Administration
Billie Loyce Hensley, Texas
Business Administration
Harvey William Huntzinger, Virginia
Business Administration
Richard James Hurder, Maryland
Business Administration
James Edward Johnson, Maryland
Business Administration
Harold Glenn Keebaugh, Virginia
Business Administration
George Robert Lamb, Sr., Virginia
Business Administration

Lester Boggess Lampman, Virginia
Business Administration
Clyde Carlton McPherson, Virginia
Business Administration
Alvin Moore, Virginia
Accounting
Robert Dayton Norvell, Illinois
Business Administration
Donald Glenn Patterson, Virginia
Business Administration
Henry Ford Peacock, Virginia
Business Administration
Robert Gene Perry, District of Columbia
Accounting
Carlyle Nerdahl Rogers, Michigan
Business Administration
Jerome Donald Rosplock, Wisconsin
Business Administration
Raymond Joseph Sbalbi, Maryland
Business Administration
Paul Richard Shackelford, California
Business Administration
Patricia Mary Shaughnessy, Virginia
Business Administration
Robert Stanley Skelly, Maryland
Business Administration
Henry Walton Steadman, Tennessee
Business Administration
David Michael Votta, Virginia
Business Administration
Larry Leon Waggoner, Virginia
Business Administration
Nathan Joseph Weissman, Maryland
Business Administration
Carl Anthony Wesolowski, Pennsylvania
Business Administration

MASTER OF ARTS IN GOVERNMENT

Arthur Leon Beamon, Illinois
Public Administration
B.S. 1965, U.S. Air Force Academy
Robert Yost Bonham, Virginia
Public Administration
B.A. 1967, Emory and Henry College
Paul Eddie Dwyer, District of Columbia
Public Administration
B.A. 1967, Baylor University

Walter Murray Leech, Virginia
Public Administration
B.A. in Govt. 1949, George Washington
University
Franklin David Marks, Maryland
Public Administration
B.A. 1967, Ohio Wesleyan University

Robert Harmon Osborn, Virginia
Personnel Administration
B.A. 1952, Maryville College

Irving Peter Smith, Maryland
Personnel Administration
B.A. 1956, Niagara University

MASTER OF BUSINESS ADMINISTRATION

Maurice Filmore Allen, Virginia
Business Administration
B.B.A. 1956, University of
Massachusetts
Victor Bernard Allen, Maryland
International Business
B.B.A. 1969, George Washington
University
James Lee Amos, Ohio
Health Care Administration
B.A. 1965, Providence College
Thomas Anderson, Virginia
Business Administration
B.B.A. 1954, City College, New York
Sister Mary Susan Ashton, Arizona
Health Care Administration
B.A. 1961, Mount St. Agnes College
Richard Baccante, New York
Business Administration
B.S. in B.A. 1968, Georgetown
University
Neil Edward Bennett, Florida
Health Care Administration
B.S. 1964, West Liberty State College
William Everett Beyers, Pennsylvania
International Business
B.S. in M.E. 1967, Drexel Institute of
Technology
Charles Louis Bieler, Pennsylvania
Health Care Administration
B.S. 1966, Boston University
Kendall Harold Breedlove, Virginia
Business Administration
B.A. 1968, Duke University
Roger Michael Burgess, Indiana
Health Care Administration
B.S. in Phar. 1962, University of
Kansas
John Patrick Carey, Texas
Business Administration
B.S. in C.E. 1964, Texas Technological
University
Frank Alfred Carter II, New York
Health Care Administration
B.B.A. 1967, Stetson University
Judith Anne Chicka, Pennsylvania
Business Administration
B.B.A. 1960, University of Pittsburgh

Thomas Gwyn Craft, Virginia
Business Administration
B.S. in B.A. 1957, University of South
Carolina
Paul Joseph De Bruyne, Pennsylvania
International Business
B.A. 1966, St. Mary's College, Minn.
Kenneth Michael DeGon, Washington
Business Administration
B.S. 1964, U.S. Military Academy
Ronald Michael Del Duca, Virginia
Business Administration
B.S. 1957, U.S. Naval Academy
Henry Louis Di Re, Missouri
Health Care Administration
B.A. 1950, Montana State University
M.A. 1952, New York University
Robert George Drach, Maryland
Business Administration
B.S. 1956, Rutgers, the State University
William Edward Duey, Virginia
Business Administration
B.S. 1959, Pennsylvania State
University
Peter Austin Duffy, Virginia
Business Administration
B.S. 1962, U.S. Naval Academy
Mohamed Salah El din El Sayed, District
of Columbia
International Business
B.B.A. 1963, Cairo University, Egypt
Thomas Joseph Faleskie, Virginia
Business Administration
B.S. 1958, University of Scranton
Gary William Farnes, Maryland
Health Care Administration
B.S. 1967, Brigham Young University
John Brett Farnham, Massachusetts
Health Care Administration
B.S. 1967, Union College, N.Y.
Fred Yates Fellows, South Dakota
Business Administration
B.S. 1962, U.S. Naval Academy
Richard Jay Ferst, Pennsylvania
Business Administration
B.S. in B.A. 1967, American University
Lynn Roger Flach, Virginia
Business Administration
B.B.A. 1955, University of Miami

- Bruce Michael Fleisher, Illinois
Business Administration
B.S. 1967, University of Pennsylvania
- William James Forristall, Maryland
Business Administration
B.Gen.Std. 1967, University of
Nebraska at Omaha
- Sister Marlene Fox, Pennsylvania
Health Care Administration
B.S. in Ed. 1965, Duquesne University
- Fred Stanton Garner, Virginia
Business Administration
B.S. in B.A. 1958, University of Florida
- Richard Dirk Gnodde, New Jersey
International Business
B.A. in Ed. 1964, George Washington
University
- Earl Eugene Goodwin, Virginia
Business Administration
B.A. 1954, Texas A&M University
- Paul Richard Goodwin, Maryland
Business Administration
B.C.E. 1965, Cornell University
- Gene Lee Hammett, Virginia
Health Care Administration
B.S. in Gen.Std. 1968, George
Washington University
- John Osborne Hayden, Pennsylvania
Health Care Administration
B.A. 1967, American International
College
- John Gilbert Hekman, California
Business Administration
B.A. 1961, Calvin College
- Morris Deen Helton, Missouri
Business Administration
B.S. 1964, U.S. Coast Guard Academy
- Robert Milton Hines, Indiana
Business Administration
B.S. in Phar. 1955, University of North
Carolina at Chapel Hill
- Gerald Thomas Holland, District of
Columbia
International Business
B.A. 1969, George Washington
University
- DeLanson Young Hopkins, Massachusetts
Health Care Administration
B.A. 1964, University of Virginia
- Karl Hans Hutzler, Virginia
Business Administration
B.S. 1960, State University of New
York at Buffalo
- Raymond Cyril Jaecques, Pennsylvania
Business Administration
B.S. 1958, Pennsylvania State
University
- William Don James, Alabama
Business Administration
B.S. 1961, University of Alabama
- Frederick Rulfs Keith, Jr., Georgia
Business Administration
B.S. in Ind.Mgt. 1957, B.S. in I.E. 1958,
Georgia Institute of Technology
- Charles Richard Kendrick, Jr., Maryland
Business Administration
B.A. 1964, Princeton University
- Thomas Allen Kenzik, Virginia
Business Administration
B.S. in F.S. 1967, Georgetown
University
- John Richard Kozik, Maryland
Business Administration
B.A. 1966, George Washington
University
- John Harris Kunkle, Maryland
Business Administration
B.B.A. 1955, University of Pittsburgh
- James John Lantry, New Jersey
Business Administration
B.S. 1963, U.S. Coast Guard Academy
- Lawrence Gerard Larkin, Maryland
Business Administration
B.A. 1957, University of Maryland
- Frederic Lewis Laughlin, Michigan
Business Administration
B.S. 1965, U.S. Military Academy
- Percy Lee Lawrence III, Louisiana
Health Care Administration
B.A. 1967, Centenary College
- Kathryn Ann Lee, New York
Health Care Administration
B.S. 1960, Ithaca College
- Alvin Roy Lewitas, New Jersey
Health Care Administration
B.A. 1967, University of Maryland
- James Noble Lindstrom, Virginia
Business Administration
B.A. 1961, University of Kansas
- Ronald Wai Wah Loke, District of
Columbia
Business Administration
B.B.A. 1968, University of Singapore
- James Roger Lyons, Virginia
Business Administration
B.S. 1958, U.S. Naval Academy
- Stanley Alan Mace, Virginia
Business Administration
B.A. 1967, Ohio University
- Stephen Michael Markman, District of
Columbia
International Business
B.S. in Econ. 1968, University of
Pennsylvania

- William Baker Marshall III, District of Columbia
Business Administration
B.B.A. 1961, University of Massachusetts
- William Henry McAndrew, Pennsylvania
Business Administration
B.B.A. 1964, St. Bonaventure University
- Peter Joseph McAteer, New Hampshire
Business Administration
B.S. 1964, U.S. Military Academy
- Aims Chamberlain McGuinness, Jr., Maine
Health Care Administration
B.A. 1965, University of Pennsylvania
- Din Merican, Malaysia
International Business
B.A. 1963, University of Malaya
- Michael Robert Merson, New York
Health Care Administration
B.S. in B.A. 1966, University of Denver
- Winston Burdette Miller, Virginia
Business Administration
B.B.A. 1958, University of Texas at Austin
- Fredrick Gerard Mitchell, Virginia
Business Administration
B.S. 1958, University of Pennsylvania
- Stanley Kelley Moseley, Pennsylvania
Health Care Administration
B.B.A. 1967, George Washington University
- Thomas Clement Murphy, New York
Health Care Administration
B.S. 1966, Union College, N.Y.
- Merritt Lee Murry, District of Columbia
Business Administration
B.B.A. 1961, George Washington University
- J.D. 1964, Northwestern University
- Alvin William Musgrave, Jr., Texas
Business Administration
B.S. in Ed. 1963, Southwest Texas State College
- Thomas Matiku Nyitambe, Tanzania
Health Care Administration
B.A. 1967, Goshen College
- Ann Denise O'Leary, Missouri
Health Care Administration
B.S. 1958, St. Louis University
- Linda Albert Onstad, Virginia
Business Administration
B.S. 1965, U.S. Coast Guard Academy
- Curtis Heath Onthank, Virginia
Business Administration
B.A. 1964, Lake Forest College
- Glenn Frederic Peterson, Florida
Health Care Administration
B.B.A. 1968, George Washington University
- Robert Frank Pliska, Illinois
Business Administration
B.S. in Com. 1955, DePaul University
- Duane Ernest Potter, Washington
Business Administration
B.S. in Gen.Std. 1969, George Washington University
- Donald Fredric Rabinovitch, New York
International Business
B.B.A. 1967, Pace College
- David Eugene Ridley, Virginia
Business Administration
B.A. 1955, Samford University
- Richard Dennis Rose, Maryland
Business Administration
B.S. 1964, Bradley University
- Stephen Allen Rosenberg, New Jersey
Health Care Administration
B.S. 1966, American University
- Jack Kendall Russell, Texas
Business Administration
B.B.A. 1961, Texas A&M University
- Arthur Sidney Shorr, Michigan
Health Care Administration
B.S. 1967, Brooklyn College
- Donald Lewis Shubert, California
Health Care Administration
B.A. 1964, University of California, Los Angeles
- Edwin Neil Smellow, Virginia
Business Administration
B.A. 1958, Antioch College
- Billy Lee Speed, Virginia
Business Administration
B.B.A. 1964, Eastern New Mexico University
- John Blaine Stalder, Virginia
Business Administration
B.B.A. 1963, George Washington University
- Richard Lynn Stewart, Virginia
Business Administration
B.A. 1962, Claremont Men's College
- Thomas Rodney Stuart, Virginia
Business Administration
B.S. 1951, U.S. Naval Academy
- John Alden Swartwout, Jr., Massachusetts
Health Care Administration
B.S. 1964, Tufts University
- William Carrington Sydnor, Maryland
International Business
B.S. 1962, Virginia Military Institute

Archie Barnard Taylor, Jr. District of
Columbia
Business Administration
B.A. 1963, Howard University
Cecilia Ann Thomson, Utah
Health Care Administration
B.S. 1956, University of Utah
Walter Louis Underwood, Florida
Health Care Administration
B.A. 1965, Wake Forest University
Thomas Gerard Vavrina, Maryland
Business Administration
B.S. 1958, Loyola College
Louis Joseph Vinci, Florida
Health Care Administration
B.S. in Phar. 1967, Fordham University
Edward Keith Walker, Jr., Virginia
Business Administration
B.S. 1954, U.S. Naval Academy

Harold Thomas Ward, Jr., Virginia
Business Administration
B.A. 1959, The Citadel
Harry Blake Wareham, Virginia
Business Administration
B.B.A. 1958, University of Minnesota
Leonard Irving Weinstein, Florida
Health Care Administration
B.B.A. 1967, City College, New York
Mohan Ranjit Wikramanayake, Ceylon
International Business
Postgraduate Diploma in Management
Studies 1967, University of Glasgow,
Scotland
LL.B. 1961, University of Ceylon
Allan Lucius Willey, Virginia
Business Administration
B.A. 1963, College of William and
Mary

MASTER OF PUBLIC ADMINISTRATION

Richard Joseph Collins, Virginia
Public Administration
B.S. 1957, U.S. Coast Guard Academy
John Joseph LaMazza, New York
Public Administration
B.S. 1956, Cathedral College of the
Immaculate Conception

Charles Dominic Murphy, Jr., Delaware
Public Administration
B.A. 1967, Villanova University

MASTER OF SCIENCE IN ADMINISTRATION

Douglas Anderson, Jr., Virginia
Automatic Data Processing
B.A. 1952, University of Texas at
Austin
Daniel Sidney Appleton, Virginia
Systems Management
B.S. 1940, U.S. Naval Academy
Ernest Ronald Arthur, Virginia
International Commerce
B.A. 1964, Florida State University
Jack Howell Bader, Ohio
Management Engineering
B.S. in E.E. 1967, University of Dayton
Richard J. Baird, Virginia
Management Engineering
B.S. in Chem. 1956, Indiana University
M.S. in Chem. 1964, University of
Missouri at Rolla
Donal Gordon Barger, Maryland
Public Personnel Management
B.S. 1961, University of Maryland
James Schilling Baumstark, Maryland
Industrial Personnel Management
B.S. 1964, U.S. Naval Academy

Louis Wilson Berry, Jr., Maryland
Management Engineering
B.S. in M.E. 1965, Bucknell University
James Lynn Biss, Virginia
Automatic Data Processing
B.A. 1966, Pennsylvania State
University
Edgar Dean Block, Virginia
Automatic Data Processing
B.A. 1964, California State College at
Long Beach
Robert Haddock Blount, Virginia
Systems Management
B.S. in E.E. 1947, Massachusetts
Institute of Technology
Melvin David Borer, Maryland
Automatic Data Processing
B.S. in B.A. 1966, Drexel Institute of
Technology
Thomas Edward Bowman, Virginia
Public Personnel Management
B.S. in F.S. 1963, Georgetown
University

- Thomas Clarke Brooks, Virginia
Management Engineering
B.S. 1965, University of Kansas
- Robert James Bryer, Maryland
Management Science—Operations
Research
B.S. in Ae.E. 1967, University of
Maryland
- Robert William Buchan, Virginia
Management Engineering
B.M.E. 1966, University of Virginia
- Jess Lee Cariker, Jr., Virginia
Management Engineering
B.S. 1950, U.S. Naval Academy
- Peter Jerome Cervarich II, Virginia
Management Engineering
B.S. 1958, Virginia Polytechnic
Institute
- George Benedict Chafee, Jr., Maryland
Public Personnel Management
B.S. 1958, U.S. Naval Academy
- Richard James Christofferson, California
Industrial Personnel Management
B.S. 1952, University of Utah
- Edward Drewry Collins, Jr., Virginia
Management Engineering
B.S. 1956, Virginia Polytechnic
Institute
- John Edward Cooper, Virginia
Management Engineering
B.S. in E.E. 1959, Lehigh University
- Roger Merlin Cooper, Virginia
Management Science—Operations
Research
B.S. 1964, University of Utah
- Quentin Reckie Corrie, Virginia
Management Engineering
B.S. in M.E. 1968, Bucknell University
- Richard Leland Cowles, Virginia
Governmental Administration
B.S. 1958, Cornell University
- Scott Albert Crabtree, North Carolina
Automatic Data Processing
B.A. 1966, Elon College
- Eli Dabich, Jr., Maryland
Industrial Personnel Management
B.S. 1963, U.S. Naval Academy
- Ralph Glenn Davis, Virginia
Management Engineering
B.S. 1954, U.S. Naval Academy
M.S. 1960, Massachusetts Institute of
Technology
- Michael Henry De Groot, Virginia
Systems Management
B.S. 1962, St. Norbert College
- Gene Trayser Dunaway, Virginia
International Commerce
B.S. 1950, U.S. Naval Academy
- Donna Zink Eden, Virginia
Industrial Personnel Management
B.A. 1967, Smith College
- Kenneth Oscar Ekelund, Jr., Maryland
Systems Management
B.S. 1946, U.S. Naval Academy
- Clifford Melker Erickson, Virginia
Industrial Personnel Management
B.S. in M.E. 1964, Tufts University
- Robert Vito Ferraro, Virginia
Management Engineering
B.S. 1964, U.S. Naval Academy
- Francis Charles Fogarty, Virginia
Industrial Personnel Management
B.S. 1948, U.S. Naval Academy
- Rodney Burl Frazier, Maryland
Public Personnel Management
B.A. 1965, Fresno State College
- Michael Lee Gauer, Virginia
Automatic Data Processing
B.S. 1963, Marquette University
- Charles Ronald Goodling, Virginia
Automatic Data Processing
B.S. 1959, Pennsylvania State
University
- Joseph Ray Goudy, Virginia
Management Engineering
B.S. in M.E. 1959, University of Toledo
- Jack Ivan Grams, Virginia
Systems Management
B.S. 1965, Cornell College
- Richard Thomas Grant, Ohio
Automatic Data Processing
B.S. 1952, U.S. Naval Academy
- Gordon Earl Gray, Jr., Illinois
Automatic Data Processing
B.S. 1966, University of Illinois
- Stanley David Griggs, Maryland
Management Engineering
B.S. 1962, U.S. Naval Academy
- William Dennis Halloran II, Maine
Industrial Personnel Management
B.A. 1963, Bowdoin College
- John Raymond Herechmak, New York
Business Financial Management
B.S. 1964, Austin Peay State College
M.S. 1965, University of Tennessee
- Jon Richard Harris, Maryland
Public Personnel Management
B.S. 1963, U.S. Naval Academy

- James Malcolm Hazelwood, Virginia
Systems Management
B.S. in I.E. 1951, Lehigh University
- Faust Francis Hughes, Jr., Maryland
Management Engineering
B.S. 1962, U.S. Naval Academy
- Jerry R. Icenogle, Virginia
Management Science—Operations
Research
B.S. 1966, Missouri Valley College
- Donald Myron Jacobs, Maryland
Automatic Data Processing
B.A. 1962, University of California,
Los Angeles
- John Martin Jacobson, Virginia
Systems Management
B.Gen.Std. 1967, University of
Nebraska at Omaha
- Richard Floyd Johnson, Virginia
Management Engineering
B.S. in Geol. 1961, University of
Oklahoma
- Donald Philip Kelley, Virginia
Management Engineering
B.S. 1953, University of Maine
- John Joseph Krajewski, Virginia
Systems Management
B.E.E. 1963, University of Dayton
- Harvey Fred Kramer, Maryland
Industrial Personnel Management
B.S. 1960, U.S. Naval Academy
B.S. in M.E. 1966, U.S. Naval
Postgraduate School
- Bernard Francis Kruer, California
Industrial Personnel Management
B.A. 1966, Loyola University of Los
Angeles
- Paul R. Kugler, Virginia
Industrial Personnel Management
B.A. 1962, Paterson State College
- Raymond Anthony Kutch, Maryland
Industrial Personnel Management
B.S. 1963, U.S. Naval Academy
- John Joseph Leffler, Virginia
Automatic Data Processing
B.S. 1951, U.S. Military Academy
- David Earl Leigh, Maryland
Management Engineering
B.S. in M.E. 1968, University of Texas
at Austin
- Lee Haltom Livingston, Maryland
Management Engineering
B.S. 1963, U.S. Naval Academy
M.S. 1965, Air Force Institute of
Technology
- Russell Lloyd, Jr., New Jersey
Governmental Administration
B.A. 1954, Colgate University
- Elmer Jay Lybert, Virginia
Management Engineering
B.S. in C.E. 1954, Norwich University
- Thomas Walter MacConnell II, Maryland
Systems Management
B.S. in Gen.Std. 1969, George
Washington University
- Kenneth Logan MacLeod III, Virginia
Systems Management
B.S. 1960, U.S. Naval Academy
- Daniel Malachuk, Jr., Virginia
Business Financial Management
B.A. 1965, Hamilton College
- Willis Harold Martin, Jr., Virginia
Management Science—Operations
Research
B.A. 1961, Franklin and Marshall
College
- Frank Mabbett McCraw, Jr., Virginia
Business Management
B.S. 1950, U.S. Naval Academy
- Thomas John McKay, West Virginia
Industrial Personnel Management
B.S. 1965, U.S. Naval Academy
- Albert Joseph McMahon, Jr., Illinois
Management Engineering
B.A. 1967, MacMurray College
- George Francis Monahan, Virginia
Automatic Data Processing
B.S. 1961, Manhattan College
- Paul Davis Moses, Virginia
Systems Management
B.S. 1961, U.S. Naval Academy
- Robert Alvin Neitzke, Virginia
Systems Management
B.S. 1960, University of Wisconsin
- Robert Raymond Ohsiek, California
Automatic Data Processing
B.S. in Gen.Std. 1968, George
Washington University
- Thadeus Samuel Oliver III, Virginia
Management Science—Operations
Research
B.S. 1965, George Institute of
Technology
- Rocco John Pangallo, Maryland
Business Financial Management
B.Mgt.Engr. 1964, Rensselaer
Polytechnic Institute
B.S. 1964, St. Lawrence University
- John Quinten Parsons, Maryland
Management Engineering
B.S. 1959, Washington College

- Hugh Pat Pate, Virginia
Management Engineering
B.A. 1960, University of Texas at Austin
- Sidney Fay Pauls, Virginia
Management Engineering
B.A. 1958, College of William and Mary
- Alton Andrew Pedersen, Nevada
Management Engineering
B.S. 1953, U.S. Naval Academy
B.S. in E.E. 1961 U.S. Naval Postgraduate School
- Elmer Bruce Peters, Virginia
Management Engineering
B.S. 1949, U.S. Military Academy
- Samuel Blair Poteate, Jr., Virginia
Management Engineering
B.S. 1951, Virginia Polytechnic Institute
- Eric Lemuel Puckett, Virginia
Management Engineering
Bachelor of Liberal Studies, 1968, University of Oklahoma
- George Bertrum Randolph, Jr., Virginia
Automatic Data Processing
B.S. 1948, Wake Forest University
- Charles Anthony Rankowski, Pennsylvania
Systems Management
B.A. 1942, B.S. in Ed. 1942, Bowling Green State University
B.S. in Electronics Engr. 1951, M.S. in Engr. Electronics 1968, U.S. Naval Postgraduate School
- James LeRoy Raper, Virginia
Management Engineering
B.S. in M.E. 1959, North Carolina State University at Raleigh
- Chalmers Frederick Rea, New Mexico
Management Engineering
B.S. 1955, University of New Mexico
- John Paul Ribka, Virginia
Systems Management
B.S. in Engr.Sci. 1964, University of Notre Dame
- Harry Melville Rogers, Maryland
Systems Management
B.S. 1945, U.S. Naval Academy
- Carl Frederick Russ, Maryland
Automatic Data Processing
B.S. 1958, U.S. Naval Academy
- Billy Emerson Russell, Tennessee
Management Engineering
B.S. 1966, U.S. Naval Academy
- Richard Leo Scharpf, Virginia
Management Engineering
B.S. in Aerospace Engr. 1961, University of Texas at Austin
- Robert Eugene Schmidt, Virginia
Management Engineering
B.S. 1961, U.S. Naval Academy
- Gerald Walter Scholand, Virginia
Management Engineering
B.M.E. 1963, Marquette University
- Owen Edward Schrader, Virginia
Management Engineering
B.S. in M.E. 1962, University of Iowa
- Thomas Paul Schurr, Virginia
Automatic Data Processing
B.S. 1952, U.S. Naval Academy
- Gary Robert Schwandt, Virginia
Systems Management
B.A. 1967, Dartmouth College
- William Coppedge Sharpe, Virginia
Management Engineering
B.A. 1958, University of Mississippi
- Scott Schaefer Shenton, Virginia
Automatic Data Processing
B.S. 1959, U.S. Naval Academy
- George Walter Shuppert, Maryland
Systems Management
B.E.S. 1958, Johns Hopkins University
- John Pershing Slavin, Jr., Maryland
Management Engineering
B.S. 1967, Lowell Technological Institute
- Richard Carl Soderholm, Illinois
Management Engineering
B.S. 1954, U.S. Naval Academy
- Cary Redford Spitzer, Virginia
Management Engineering
B.S. 1959, Virginia Polytechnic Institute
- Fred Lee Staggs, Virginia
Management Engineering
B.S. in E.E. 1962, University of Alabama
- Martin Staiger, Maryland
Management Engineering
B.Maritime Engr. 1958, State University of New York, Maritime College
B.S. in E.E. 1964, U.S. Naval Postgraduate School
- Gilbert Stockman, Virginia
Public Financial Management and Budgeting
B.S. 1961, University of Maryland
- Robert Scott Stone, District of Columbia
Systems Management
B.S. 1946, U. S. Naval Academy

- Wayne Earl Studebaker, Virginia
Management Engineering
B.S. in M.E. 1960, Oklahoma State
University
- Joel Leslie Terry, Jr., Virginia
Management Engineering
B.S. 1954, Virginia Polytechnic Institute
- Ronald Nayland Tokay, Virginia
Procurement and Contracting
B.S. in Business 1955, Miami University
- Judith Louise Wagner, Virginia
Systems Management
B.S. 1964, Madison College
- Daniel Paul Walsh, Virginia
Systems Management
B.A. 1959, Boston College
- James Clark Ward, Jr., Virginia
Management Engineering
B.S. in E.E. 1963, Tennessee
Technological University
- Fletcher Kirkland Ware, Virginia
Automatic Data Processing
B.S. 1954, U.S. Military Academy
- Nicholas Jon Welp, Oregon
Public Financial Management and
Budgeting
B.S. 1967, B.S. in B.A. 1967, Oregon
State University
- Dwight Vern Wilson, Virginia
Procurement and Contracting
B.S. 1954, Iowa State University of
Science and Technology
- Leland Allen Wilson, Washington
Systems Management
B.Gen.Ed. 1963, University of
Nebraska at Omaha
- Charles John Wright, Maryland
Management Engineering
B.S. 1966, University of Maryland
- William George Wright, Virginia
Management Engineering
B.S. in M.E. 1967, Virginia
Polytechnic Institute
- Paul Ray Yeager, Virginia
Management Engineering
B.A. 1952, Austin College
- Joseph John Yurko, Virginia
Automatic Data Processing
B.Gen.Ed. 1960, University of
Nebraska at Omaha

MASTER OF SCIENCE IN BUSINESS ADMINISTRATION

- Robert Eugene Evans, Virginia
B.S. in Jour. 1954, Northwestern
University
- Donald Guy Gascoigne, Virginia
B.A. 1952, Washburn University of
Topeka
- Donald Allen Ice, Virginia
B.Gen.Ed. 1960, University of
Nebraska at Omaha
- Frank Wilson Kiel, Maryland
B.A. 1950, University of Pittsburgh
M.D. 1954, LL.B. 1967, George
Washington University
- George William Martin, Maryland
B.S. 1955, U.S. Naval Academy
- Charles Scoville Stauffer, California
B.A. 1964, University of California,
Berkeley
- Thomas Bowman White, Jr., Virginia
B.S. in E.E. 1948, B.S. in Naval Science
Tactics 1948, Purdue University
M.A. 1969, University of Maryland
- Donald Lee Worley, North Carolina
B.S. 1961, University of North
Carolina at Chapel Hill

MASTER OF SCIENCE IN FINANCIAL MANAGEMENT

- Melvin Bender, Maryland
B.S. 1949, University of Maryland
- Murray Dean Blank, Maryland
B.S. 1958, U.S. Naval Academy
- Harold Bloom, Maryland
B.B.A. 1958, City College, New York
- Robert Aloysious Gallagher, Maryland
B.S. 1967, Johns Hopkins University
- Charles Robert Miller II, Maryland
B.A. 1965, Rutgers, the State University
- Donald Chris Peterson, Virginia
B.S. 1951, Wisconsin State University,
Superior
B.S.E. 1963, University of Michigan
- William Hamilton Rhodes, Virginia
B.B.A. 1967, George Washington
University
- Marion Allen Smith, Maryland
B.S. 1963, Murray State University

Michael Thomas Smokovich, Maryland
B.S. in B.A. 1965, Duquesne University
Walter Theodore Stundick, Maryland
B.S. 1964, Loyola College

Philip Wayne Tigan, Maryland
B.S. (Accountancy) 1959, University
of Illinois
Stephen Joseph Varholý, Virginia
B.B.A. 1963, Fairfield University

MASTER OF SCIENCE IN GOVERNMENTAL ADMINISTRATION

Francis Malcolm Byrne, Virginia
B.A. 1955, George Washington
University
Robert Lee Dunker, Jr., Maryland
B.S. 1959, University of Maryland
Walter Vincent Ebert, Virginia
B.B.A. 1943, Niagara University
George Peter Failla, Maryland
B.B.A. 1962, City College, New York
Shelton Dickinson Granade, District of
Columbia
B.S. in B.A. 1959, Auburn University
William Paul Haubner, Virginia
B.A. 1966, George Washington
University
Robert Hobert Huddleston, District of
Columbia
B.S. in P.A. 1949, University of
Missouri at Columbia

Virginia Tressel Keller, Maryland
B.A. 1957, Agnes Scott College
Charles George Lauer, Virginia
B.S. 1962, University of Maryland
Trent Otho McPherson, Jr., Maryland
B.A. 1954, George Washington
University
Rona Beth Schumer, Maryland
B.S. 1966, Duke University
William Adalbert Sinko, Virginia
B.A. 1961, George Washington
University
Thomas Joseph Slaughter, Maryland
B.A. 1964, University of Maryland
Thomas Richard Thomas, Maryland
B.A. 1963, George Washington
University
James Henry Walker, Virginia
B.A. 1961, Pennsylvania State
University

MASTER OF SCIENCE IN PERSONNEL ADMINISTRATION

Ronald Carol Baker, Maryland
B.S. 1962, U.S. Naval Academy
Otto Frederick Beckhoff, Virginia
B.A. 1956, University of Toledo
Robert Stevens Bell, Maryland
B.S. 1964, U.S. Naval Academy
Arnold Isaac Berman, Ohio
B.S. 1962, University of Maryland
Peter Aidan Browne, Maryland
B.S. 1963, U.S. Naval Academy
Robert Asplund Clemens, Maryland
B.S. 1954, University of Maryland
Richard Samuel Dali, Maryland
B.A. 1965, King's College, Pa.
William Allen Darden, Tennessee
B.S. in C.E. 1935, Georgia Institute of
Technology
Lois Albertine Derrough, Virginia
B.A. 1960, Bowling Green State
University
Lester Adler Fowler, Texas
B.S. 1964, University of Maryland
Glenn Roland Gjertson, Maryland
B.A. 1951, University of California,
Los Angeles

Robert Arthur Gould, Virginia
B.S. 1967, Northeastern University
Frederick Brockway Heck II, District of
Columbia
B.B.A. 1966, George Washington
University
Richard Warren Jensen, Virginia
B.S. 1950, University of Utah
John William Kuncas, Maryland
B.S. 1952, U.S. Naval Academy
B.S. 1958, U.S. Naval Postgraduate
School
James George Kuyawa, Jr., Maryland
B.E.S. 1962, Johns Hopkins University
Paul Augustus Lawhorne, Maryland
B.A. 1950, Guilford College
Robert Joseph McCarthy, Maryland
B.B.A. 1965, George Washington
University
Mack Russell McClure, Virginia
B.S. in C.E. 1948, Illinois Institute of
Technology
George Bernard Michel, Maryland
B.S.E. 1959, Johns Hopkins University

Robert James Moore, Maryland
 B.S. 1966, University of Baltimore
 David Leon Printz, Maryland
 B.S. in E.E. 1962, University of
 Maryland

Glenn Marlon Williams, Texas
 B.Gen.Ed. 1964, University of
 Nebraska at Omaha
 Joel Richard Zaiantz, Maryland
 B.S. 1960, University of Florida

MASTER OF SCIENCE IN PUBLIC ADMINISTRATION

Chester Gregory Bazel, Virginia
 B.S. in Phar. 1952, Ohio State
 University
 M.S. in Phar. 1957, University of
 Southern California
 Charles Gordon Beck, Jr., Virginia
 B.A. 1951, DePauw University
 Edward William Dolan, Maryland
 B.A. 1963, Florida State University
 Lloyd Goode Johnson, Virginia
 B.A., B.Dip. in Ed. 1941, University
 of Colorado
 Joseph Easton Mirman, Maryland
 B.A. 1953, Brown University

Gerald Erwin Neumann, Virginia
 B.S. in C.E. 1948, Ohio State University
 Lawrence Anthony Pratt, Virginia
 B.S. in Com. 1959, Ohio University
 Gerald Charles Quinlan, Virginia
 B.S. 1951, American International
 College
 John Robert Reida, Virginia
 B.A. 1950, M.S. in S.S. 1952, Boston
 University
 George Rubinstein, Maryland
 B.A. 1939, Brooklyn College
 LL.B. 1942, Brooklyn Law School

DOCTOR OF BUSINESS ADMINISTRATION

Moustafa Hassan Abdelsamad, Virginia
 Dissertation: *Evaluating Capital Expenditure Proposals in Large Industrial
 Corporations*
 B.Com. 1961, Cairo University, Egypt
 M.B.A. 1965, George Washington University

John Andrew Byrne, Maryland
 Dissertation: *Problems of Adapting the Department of Defense Cost Effective-
 ness Analysis System to Nondefense Agencies*
 B.S. in B.A. 1949, Babson Institute of Business Administration
 M.B.A. 1956, George Washington University

Edward Meier Cross, Virginia
 Dissertation: *The Behavioral Styles, Work Preferences, and Values of an Occu-
 pational Group: Computer Programmers*
 B.A. 1956, Harvard University
 M.B.A. 1963, University of Pennsylvania

George Edgar Deal, Virginia
 Dissertation: *The Pricing of Clinical Laboratory Tests*
 B.S. in Business 1941, M.S. in Business 1942, Indiana University

Herbert Vern Ladley, Virginia
 Dissertation: *A Business Simulation Study of the Behavioral Implications of
 Price-level Adjustments to Financial Statements*
 B.A. 1941, University of Washington
 M.B.A. 1953, George Washington University

William Woodrow Metz, Florida

Dissertation: *Identification and Analysis of Research and Development Project Management Problems Based on Nonnuclear Munitions Development in the Air Force*

B.S. 1940, Northwest Missouri State College

M.B.A. 1963, Florida State University

James Richard Miller, Virginia

Dissertation: *Selecting Computing Programmers: A Multivariate Approach to the Determination of Predictors Using an Improved Criterion for On-the-Job Success of Male and Female Computer Programmers*

B.S. 1955, U.S. Military Academy

M.E.A. 1962, George Washington University

Hubert Preston Mills, Virginia

Dissertation: *A Critical Review and Appraisal of the Organization, Practices, and Policies of the United States Navy in the Management of Aeronautical Engineering Changes (Modifications) to Weapons Systems and Equipment*

B.S. 1941, Oklahoma State University

M.B.A. 1951, Stanford University

Charles John Pearce, Maryland

Dissertation: *An Appraisal of Hospital Administration Education in the U.S. Navy*

B.A., M.A. 1964, George Washington University

Francis Joseph Pettit, Virginia

Dissertation: *Effects on Selected Steel Imports of a Substitution of a Value-added Tax for the Corporation Income Tax*

B.S. in F.S. 1964, Georgetown University

M.B.A. 1966, George Washington University

James Rudolph Roman, Jr., District of Columbia

Dissertation: *Opportunities for Railroad Passenger Service in the Northeast Corridor*

B.S. 1958, Bucknell University

M.B.A. 1960, University of Maryland

Edward Robert Slack, Maryland

Dissertation: *The Effect of the U.S. International Telecommunications Industry on the United States Balance of Payments*

B.S. in B.A. 1965, Johns Hopkins University

M.S. in Fin.Mgt. 1967, George Washington University

Robert Montgomery Springer, Jr., Virginia

Dissertation: *An Analysis of Attitudes toward the Legitimacy of Supervisory Influence in a Military Environment*

B.S. 1949, U.S. Military Academy

M.A. 1955, Stanford University

Alden Patrick Sullivan, Virginia

Dissertation: *An Analysis of Management Training Program Evaluation Practices in American Industry*

B.A. 1956, George Washington University

M.B.A. 1958, Harvard University

Stephen Lawrence Tucker, Pennsylvania

Dissertation: *A Comparison of Major Teaching Hospitals and Other Community Hospitals in Terms of Characteristics and Activities of Organization and Administration*

B.A. 1962, Dartmouth College

M.B.A. 1966, Xavier University, Ohio

SCHOOL OF PUBLIC AND INTERNATIONAL AFFAIRS

BACHELOR OF ARTS

- | | |
|---|---|
| Ann Marie Abrams, District of Columbia | Robert James Gill, Kansas |
| International Affairs | International Affairs |
| Carol Marie Arnold, New York | Rhoda Lee Goldberg, Connecticut |
| International Affairs | International Affairs |
| Hajar Ataie, District of Columbia | Donella Marsha Goldman, Massachusetts |
| International Affairs | International Affairs |
| Robert Stockton Bennett, Pennsylvania | John Desmond Grzedzicki, New York |
| International Affairs | International Affairs |
| Barbara Bennison, Massachusetts | Sandra Louise Haines, District of Columbia |
| International Affairs | International Affairs |
| Thomas David Bond, Oregon | Dorothea Hamlin, Massachusetts |
| International Affairs | International Affairs |
| Bonnie Marie Borntraeger, Virginia | Joseph Breckinridge Handy IV, Virginia |
| Chinese Studies | International Affairs |
| David Michael Cain, Pennsylvania | Mary Frances Hanley, New York |
| International Affairs | International Affairs |
| Deirdre Patrice Clark, Ohio | James Loye Harvitt, Virginia |
| International Affairs | Public Affairs |
| Joan Elizabeth Cole, District of Columbia | Ruth Miles Henderson, Maryland |
| International Affairs | International Affairs |
| Bruce Alan Coleman, New Jersey | Nancy Hirschl, Ohio |
| International Affairs | International Affairs |
| Arthur Raymond Cresce, Jr., District of Columbia | Linda Cheryl Homburg, District of Columbia |
| International Affairs | International Affairs |
| Suzanne Deming, District of Columbia | Michael Craig Houser, Virginia |
| International Affairs | International Affairs |
| Arthur Hugo Dersch, Virginia | Sue Ann Hrubby, Illinois |
| International Affairs | International Affairs |
| Russell Rich DeWitt, Jr., Pennsylvania | Robert Brackin Johnson, Ohio |
| International Affairs | International Affairs |
| Nina Alix Dinell, New York | Harvey Bennett Karchmer, Arizona |
| International Affairs | International Affairs |
| George Harry Theodore Dudley, Jr., District of Columbia | Robert Anthony Kattan, District of Columbia |
| International Affairs | International Affairs |
| Arthur Eaton Edwards III, Washington | Joseph Vincent Kneib, Maryland |
| International Affairs | International Affairs |
| Dorothy Regina Fait, Florida | Susan Frances Kossin, New York |
| International Affairs | International Affairs |
| John Eliot Ferguson, Connecticut | Lois Anne Kovanda, District of Columbia |
| International Affairs (With Distinction) | International Affairs |
| David Alan Ford, Virginia | Jay Roy Kraemer, Maryland |
| International Affairs | International Affairs (With Distinction) |
| Fred Wilson Frank, District of Columbia | Melissa Ann Richards Krause, Pennsylvania |
| International Affairs | International Affairs |
| Claire Louise Fromme, District of Columbia | Marc Stewart Lifsher, Pennsylvania |
| International Affairs | International Affairs |

- Kristie Ann Maynard, New York
International Affairs
- Cedric Wayne McClinton, District of
Columbia
International Affairs (With
Distinction)
- John Albion McKinley, District of
Columbia
Chinese Studies
- Nancy Lee Miller, New York
Public Affairs
- Douglas Glenn Moore, Virginia
International Affairs
- Cynthia Louise Morrissey, Massachusetts
Chinese Studies
- John Fass Morton, Maryland
International Affairs
- Patrick Robert Myers, Virginia
International Affairs
- David Allen Nadler, Maryland
International Affairs
- Marcia Helen Nousanen, Montana
International Affairs
- Richard Francis Nutter, New Hampshire
International Affairs
- Eileen Kathryn O'Neill, Colorado
International Affairs
- Alan Edward Opresko, Florida
International Affairs
- Miriam Ramos, District of Columbia
International Affairs
- Richard Alexander Rehl, District of
Columbia
International Affairs
- Susan Hassman Samuels, District of
Columbia
International Affairs
- William Henry Shawn, Delaware
International Affairs
- Edward Charles Silverman, New York
Public Affairs
- Aurelia Simon, Delaware
International Affairs
- Phyllis Beth Simon, Virginia
International Affairs
- Claudia Eleanor Smith, Guatemala
International Affairs
- Carol Ann Swanson, Rhode Island
International Affairs
- Cheryl Ann Thomas, Massachusetts
International Affairs
- Drew Virgil Tidwell, District of
Columbia
Public Affairs
- Jon Edward Trevathan, Ohio
Public Affairs
- Sarah Baldwin Tuggle, Virginia
International Affairs
- James Trundy Verrill, New Hampshire
Public Affairs
- Alexia Sidney Whitaker, Texas
International Affairs
- Patricia Whitney, New Hampshire
International Affairs
- Barbara Jo Wilson, Pennsylvania
International Affairs
- Marc Douglas Yacker, New Jersey
Public Affairs
- Anthony Michael Zola, New York
International Affairs

MASTER OF ARTS

- Douglas Scott Bruce, Massachusetts
International Affairs
B.A. 1964, Harvard University
- Robert Eugene Cole, Virginia
Public Affairs
B.A. 1969, George Washington
University
- John Bernard Craig, Virginia
International Affairs
B.S. 1962, Worcester Polytechnic
Institute
- Donald Albert Dove, Virginia
International Affairs
B.A. in Govt. 1958, George
Washington University
- Leonid Erwin Konetschny, District of
Columbia
International Affairs
B.A. 1967, University of Maine
- Raoul Frederick Kulberg, District of
Columbia
International Affairs
B.A. 1952, Pomona College
- Neil Ellis Sterrer, New York
International Affairs
B.S. 1967, University of Wisconsin

George Strimbu, Virginia
International Affairs
B.A. 1955, Ohio University

Detta Voesar, District of Columbia
Public Affairs
B.A. 1968, George Washington
University

MASTER OF SCIENCE IN INTERNATIONAL AFFAIRS

Harold Boyd Birch, Virginia
B.S. 1951, Pennsylvania State
University
Ed. M. 1961, Colorado State University
Daniel William French, Virginia
B.S. 1960, University of Oregon
Joseph Edward Greene, Virginia
B.A. 1949, The Citadel
Robert Thomas Hanifin, Jr., California
B.Nav.Sci. 1946, Tufts University
James Arthur Herbert, West Virginia
B.S. 1945, U.S. Military Academy
Harry Newton Key, Jr., Texas
B.S. 1948, U.S. Naval Academy

William Russell Maloney, Pennsylvania
B.A. 1951, Brown University
M.A. 1963, Stanford University
William Mastoris, Jr., Virginia
B.S. 1950, U.S. Military Academy
Granville Attaway Sharpe, Florida
B.S. 1941, Davidson College
Jack Duane Stevens, Washington
B.S. 1960, University of Maryland
M.A. 1963, University of Nevada
Jackson Allison Stockton, Florida
B.S. 1943, U.S. Naval Academy
Otto William Will III, Virginia
B.S. 1953, U.S. Naval Academy
Robert George Yerks, Virginia
B.S. 1951, U.S. Military Academy

Honorary Degrees

WINTER CONVOCATION, FEBRUARY 21, 1970

DOCTOR OF LAWS

Kenneth Bancroft Clark
Henry White Edgerton
Gordon Arthur Friesen
Walter Edward Washington

DOCTOR OF SCIENCE

Severo Ochoa

ANNUAL COMMENCEMENT, JUNE 7, 1970

DOCTOR OF LAWS

Jacob Burns
Charles Cecil Wall

DOCTOR OF PUBLIC SERVICE

Jayne Baker Spain

RECIPIENTS OF AWARDS 1969-70

ASSISTANTSHIPS, FELLOWSHIPS, INTERNSHIPS, TRAINEESHIPS

- American Civilization Fellowships:* William B. Floyd, Martin K. Gordon
Arlington County-George Washington University Cooperative Assistantship: Paul D. Wireman
Winfield Scott Blaney Fellowship in International Affairs: Sharon Rich
Computers-in-Law Fellowship: David Bender
Continuing Education for Women Special Fellowships: Barbara Clemons, Evanne Martin, Fannie I. McCollum
Thomas Alva Edison Fellowship: Wallace R. Johnston
Graduate Teaching Fellowships:
Accounting: Edward N. Coffman, Robert W. Nagle
American Civilization: Jean M. Bernard, Donald H. Cresswell, Elizabeth A. Donnelly, Richard P. Krafur, Antoinette J. Lee, Jannelle J. G. Warren
Art: William Hauptman, Donald McCormick, Christine P. Meyers, Martina R. Rinehart, Jane E. Tannenbaum, Judith K. Zilczer
Biological Sciences: Lois H. Earll, Edward C. De Fabo, Charles Karnella, Hortensia M. Klos, Stephen N. Neely
Business Administration: Ahmad M. Akhavan, Edward A. Branch, Jerome B. Brightman, Richard S. Davenport, Thomas Emrich, Edward A. Hudgins, Jr., Carlton W. James, Thomas O. Jones, Jr., Everett E. Kavanaugh, Jr., Richard O. Lundquist, Donald P. Neenan, John Douglas Nelson, Michael J. Roche, Richard L. Seely, James H. Sood, Will Straver, James Ward
Chemistry: Elizabeth A. Carrico, Karen B. Crosby, Charles L. Dorian, Wilfred J. D. Foster, John S. Levy, Henry L. Meier, Jay A. Siegel
Economics: Kate A. Arbogast, Peter J. Gosnell, Fernando J. Montenegro, John J. Phelan, Bansi Sawhney, Abdelaleem M. Sharshar, John Sower, Nathaniel B. Cabanilla
Electrical Engineering: Ernesto A. Ganzaga, Michael G. Harris, Robert M. Zeskind
Engineering Mechanics: Khalilollah Khozeimeh, Yigal Pisetzky
English: Judith C. Carlberg, Margaret Casey, Shirley Hafezi, Donna Indyke, Margaret D. Lewis, Kenneth Portnoy, Marjorie A. Romines
French: Susan E. Beneke, Bettye T. Chambers, Ruth D. Clem, Karen Collins, Carolyn Davis, Jean W. Haven, Elizabeth Herring, Philomena Iannotta, Anne Matsen, Evelyn Rau, Madeleine M. Soudée, Nancy Wall, Marcia J. Weiss
Geology: Blake W. Blackwelder, Frederick Collier, Molly B. Fritz, Arlie C. Huffman, Jr., Wilfred Lunking, Raymond T. Rye II, Thomas O. Wright
German: Edward E. Broxson, Gudrun H. Klix, Anne C. Singer, Peter Werres
History: J. C. Anderson, Julia T. Celebiler, Ruth Dudgeon, Lucy L. Fisher, Maier Fox, Randall W. Jehs, Linda Lear, Anne F. Miksinski, Claire Moses, Anna L. Nelson, Martin J. A. Petersilia, David B. Shapiro, Harold D. Williams

- International Affairs:* Robert E. Cole, Suzann K. Evinger, Steven A. Haworth, Gayle M. Robinson
- Latin American Studies:* John E. Fletcher, Jr.
- Management Science:* William T. Anderson, Jr., John H. Burchett, Jr., Karla L. Rakoff, Paul N. Romani, Arlene L. Sacks, Frederick B. Wood
- Mathematics:* Chia C. Chang, Tyler Haynes, Jr., Lawrence A. Lee, John Schmeelk, David R. Slack, Richard G. Epstein
- Physical Education:* Jeanne V. Ackerman, Martha L. Allen, Charles R. Campbell, David D. Delmer, David Greenberg, William J. Oettinger II
- Physics:* Ali Ghovamlou, Allan C. Goetz, Richard C. Lee, Donald Lofland, Robert Radin, Morton F. Taragin
- Political Science:* Robert E. Brown, Scott Campbell, Phillip M. John, Henry A. Leavitt, John V. Moeser, Neil N. Seldman
- Psychology:* Stuart Appelle, Elizabeth A. Byrne, John W. Ehrhardt, Nelva E. Evans, Jeffrey S. Krebs, John McLaughlin, Joseph S. Roth, Marion O. Smith, Andrea R. Wechsler
- Public Administration:* Harold L. Grover, Melodee A. Melin
- Russian:* Alla Bilajiw, Nina G. Rosoff
- School of Government and Business Administration - Special Projects:* Jon S. Larson
- Sociology:* Arnold Arluke, Galal A. Badr, Robert J. Griggs, Susan S. Oldham
- Spanish:* Mary N. Anderson, Pablo A. Calvin, Moraima Donahue, Ellen B. Eisenberg, Kendra H. Ettenhofer, Sylvia M. Garay, Lydia D. Hazera, Ruth A. Rice, Helen E. Woods
- Speech and Drama (Speech Pathology and Audiology):* Gayle Boozer, Louise P. Hampton, Elsie Selman
- Statistics:* Francine C. Berger, Muhammad Hussain, Alimany Koroma, Aroona Saikia, Sara E. Schlesselman, Hedayat Yasaimaibodi
- Urban and Regional Planning:* Louis S. Wall
- Health Care Administration Comprehensive Health Planning Traineeships:* Richard R. Apgar, Melissa C. Banach, Carol A. Bottorff, Andrew L. Braun, Michael E. Grace, Joel T. Levine, Nan H. Ruben, Harold Sherman, Donald L. Shubert, Walter L. Underwood
- Institute for Sino-Soviet Studies Fellowships:* George T. DeSorcy, Lennard Gerson, Harvey W. Nelson, Maureen C. Neary
- W. K. Kellogg Foundation Fellowships:* Martin S. Perlin, Philip L. Reeves, Stephen L. Tucker, Jack W. White
- Isabella Osborn King Research Fellowships:* Isabel N. W. Griffith, Dee Anne Houston
- Medical Center Fellowships:*
- Anatomy:* Peter B. Berendsen, Mary F. K. Ericksen, John L. Everly, Jo-Anne Ruby, Frances P. Schalter
- Medicine:* Gil Ruiz (Allergy), Jaime Contreras (Cardiology), Ali Nayab (Cardiology), Nadim Timani (Cardiology), Rafik Boukhris (Endocrinology), Hoen-Hoang Oen (Hematology), Anne M. Thompson (Renal Diseases), Atin Guha, Manohar Kapur, Barbara M. Meyers
- Microbiology:* Harry Alwine, Newton J. Fernandez, David P. Houchens, Edwin C. Murphy, Jr., Donald L. Neugebauer, Susan M. Pember
- Neurology:* Joel Falik (Neuropathology)
- Obstetrics and Gynecology:* Arastoo Khanizadeh (Research)
- Pharmacology:* Gerrit Besselaar, Nigel E. R. Jackman, Pio Poblete (Clinical)
- Physiology:* Vivian Lauderdale, Virginia R. Phelps, Yih-Fu Shiau, Rhoda B. Yarkin, John Yun
- Radiology:* Attila S. Cigtay, Yoon C. Kim
- Mellon Foundation Fellowships:* Stephen Godoff, Ernest Holz, Robert Koch, Richard Weiner
- Minorities in Planning and Related Professions Fellowships:* Fred Grimes, Delabian Rice
- National Aeronautics and Space Administration Predoctoral Traineeships:* David S. Chang, Jerry L. Coffey, Marian R. Fisher, Hugo D. Junghenn, Richard C. Lee, Roy T. Otterbein, Charles E. Pinkus

National Defense Education Act Modern Foreign Language Graduate Fellowships (Title IV): Philip Allen, H. Lyman Miller, Carroll R. Wetzel, Jr.

National Defense Education Act Predoctoral Fellowships (Title IV): Lynn D. Bender, Pamela E. Berger, James R. Bunting, Carol S. Carson, Donna M. Chenier, Robert J. Engel, Steven J. Falken, Sandra S. Farmer, Monica D. Finkel, Linda L. Fontaine, Marilyn A. Hall, Mary L. Herring, Rodney L. Huff, Michael J. Lazna, Catherine A. McGraw, Ilona Melstrads, Deirdre R. Menoyo, John V. Moeser, Louise M. Odell, Thomas R. Robinson, Diana M. Rorabaugh, Nancy G. Schumacher, Marcia R. Scott, Jenny S. Shapiro, William E. Snow, John E. Strouse, Peter G. Tarasoff, Ruth S. Wanger, Mary E. Willingham

National Endowment for the Humanities Fellowships: James L. Lyons, Tim O. Rockwell, Peter H. Smith

National Historical Publications Commission—George Washington University Cooperative Research Fellowships: Roger G. Davis, James H. Holmes

National League of Cities/GWU Assistantships: Daniel R. Minns, Carole J. Rosen

National Law Center Research Assistantships: Donald M. Barnes, Francis L. Burk, Jay L. Carlson, John Gibbins, Alexander Mackie, Marion M. MacRae, Samuel H. Weissbard, W. Thacher Winslow, Jr.

National Law Center Teaching Fellowships: Brian Bro

National Science Foundation Graduate Fellowships: Aaron J. Prero, Page C. Valentine

National Science Foundation Graduate Traineeships: John T. Berg, Alice L. Brown, Carol M. Fields, Anne B. Hanratty, James M. Icenhour, James A. Kellogg, W. Peter Kuhn, Pauline S. Lerner, Mary E. Morgan, Edwin C. Murphy, Natalie G. Nelson, Ruth D. Salinger, Frederick J. Scheuran, Norberta W. Schoene, William D. Stanbro, Harry C. Strunz

National Science Foundation Summer Traineeships for Graduate Teaching Assistants: Philip W. Davidson, Donald R. Lehman, Anthony J. Sulvetta

Operations Research — Research Assistantships: Niranjan S. Arya, Jason Benderly, Tarsaim L. Goyal, Mark V. Hughes III, Clarise G. Lancaster, Elizabeth S. Loker, Paul G. Marlin, Curtis C. Morgan, William C. Paris, Kian C. Yu

Residence Hall Assistantships: T. A. Baxter, Camille Benhayon, C. A. Brown, Joyce DePalma, P. M. Howe, Toni Hubenette, Eleanor Judd, Beverly Kaye, Leilia Kight, E. F. Lopez, R. A. Mazzoni, T. H. McKiernan, C. R. Nash, Ann Noble, T. P. Nussbaum, J. J. Pettit, W. H. Shawn, Gail Short, B. J. Skladany, Jane Stecher, S. J. Swift, J. W. Thomas, J. W. Winchester

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Marriott Foundation Grant: Steven R. Greenfield

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Alpha Chi Sigma Freshman Awards in Chemistry: Letitia Catherine Jew, Allan David Mantel, Louis D. Rosenfield

Alpha Chi Sigma Senior Award in Chemistry: Robert Charles Rabinowitz

Alpha Delta Pi Award in scholarship and leadership: Shelley Robin Green

Alpha Kappa Psi Award in Commerce: Calvin Eugene James

American Institute of Chemists Award in Chemistry: Robert Charles Rabinowitz

American Medical Women's Association, Inc., Award: Anita Koosman Schnur

Norman B. Ames Memorial Award in Engineering and Applied Science: John Clay Davies III

Byrne Thurtell Burns Award in Organic Chemistry: Roger Bernard Thomas

Wilbur J. Carr Award to that student in the graduating class who has demonstrated outstanding ability in the study of international affairs and who has given evidence of possessing in marked degree the qualities which produce the good citizen and the dedicated public servant: Jay Roy Kraemer

Chemical Rubber Company Award in Chemistry: Doren Indritz

Columbian Women Award to the graduating senior woman who in her undergraduate life has most nearly fulfilled the objectives of Columbian Women: Doris Winifred Babb

John Henry Cowles Awards in Government:

School of Government and Business Administration: Rodney Wilcutt Frame

School of Public and International Affairs: Cedric Wayne McClinton

DeWitt Clinton Croissant Award for an essay on Drama or the Theater: Ruth Anne Bauer

E. K. Cutter Award in English: Julie Mayme Misegades, Ellen Shapiro

Isaac Davis Awards in Public Speaking:

First Prize – Michelle Lynn Slagle White

Second Prize – Vicky Lee Clark, Michael Stephen Cook

Delta Gamma Award for Scholarship, extracurricular activities, and service to the University: Kathleen Marie Troia

Department of Business Administration Award to the outstanding graduating senior in the Bachelor of Business Administration program for outstanding scholarship, leadership, and service to the University: Michelle Lynn Slagle White

Samuel M. and Miriam S. Dodek Award in Endocrinology: Paul Dennis Miller

Elton Award in Greek: Lawrence Phillips Davis

- Jesse Frederick Essary Award to that student who has given promise of sound citizenship and ability in "forthright reporting":* Bernard Daniel Colen
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- Willie E. Fitch Memorial Award in Chemistry:* Jack Olian Kaplan
- Allie S. Freed Award to that member of the graduating class in the School of Medicine who has demonstrated exceptional proficiency in the field of Preventive Medicine:* James Ward Delameter
- Walter Freeman Award to a student in the graduating class in the School of Medicine who submits the best essay based on original investigation:* Kathryn Kenders Guyton
- Charles Glover Award to that student in the National Law Center who has attained the highest average grade in the third-year, full-time course:* Samuel Held Weissbard
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- Edward Carrington Goddard Award in French:* Linda Campbell MacConnell, Faye Sharon Mervis
- Morgan Richardson Goddard Award in Commerce:* Rodney Wilcutt Frame
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- Oscar Benwood Hunter Award to a member of the graduating class of the School of Medicine who has demonstrated outstanding ability in Pathology:* Paul Dennis Miller
- Jacobi Medical Society Award to a member of the graduating class of the School of Medicine who has demonstrated outstanding ability in Pediatrics:* Wilburn William Lewis Kent
- Howard F. Kane - A.F.A. King Obstetrical Society Award:* Ronald Calvin Burton
- Kappa Kappa Gamma Award in Biology:* Jeri Susan Dimaggio
- David Lloyd Kreeger Awards in Art History and Theory:*
Undergraduate: Florine Evelyn Lyons
Graduate: Marcia Ruddy Weiss
- David Lloyd Kreeger Awards in Fine Arts:* Sharie Lois May, Peter Robert Nelsen, Nancy Jill Ronkin
- Minna Mirin Kullback Memorial Award in Statistics:* Norman B. Gelbart
- Lange Medical Publications Awards:* Donald Calvin Burton, Richard Michael Whalen
- John Bell Larner Award to that member of the graduating class of the National Law Center who attains the highest grade in the entire course for the degree of Juris Doctor:* Samuel Held Weissbard
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- Craig Sterling Logan Memorial Award to the outstanding freshman man:* Mark Brian Nadler
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- Benjamin Manchester Award to a member of the graduating class of the School of Medicine who has an outstanding record and shows promise of real humanitarianism in the practice of medicine:* Samuel Jack Scott, Jr.
- Mortar Board Award to the woman student in the Sophomore Class having a scholastic standing of B (or equivalent) or higher and the most outstanding record in activities:*
 Jean Ellen Cofsky
- C. V. Mosby Book Awards to outstanding graduates in the School of Medicine:* Leo Joseph Patrick Clark, Jay Stephen Goldberg, S. Paul Herndon IV, Robert Clemmer Palmer, John Cheung Pan
- Vivian Nellis Memorial Award to a student in the English Department who has shown special promise in Creative Writing:* John Arthur Hoehn
- Julius S. Neviaser Award on Orthopaedic Surgery:* Burton L. Redd
- Old Men Award to a man in the Junior Class who has made outstanding contributions to student activities:* Robert Allan Rosenfeld
- Omicron Delta Kappa Award to that member of the Senior Class who, throughout his course, has done the most constructive work in student activities:* David Richard Berz, David Allen Nadler

- Order of Scarlet Award to that member of the Sophomore Class who has the most outstanding record in extracurricular activities and service to the University:* Roy Kahm Chang
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- Psi Chi Awards in Psychology:*
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Graduate: Stuart Appelle
- Roche Award to the member of the graduating class who best exemplifies the ideals of the modern American Physician:* John Roy Emmett
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- William G. Schafhirt Award to a senior student in the School of Medicine for the best original essay or thesis on some medical subject of current public interest:* John Duane Wojcik
- Hermann and Johanna Richter Schoenfeld Award to a member of the graduating class for excellence in the historical and cultural phases of German studies:* Lucy Lauretta Melbourne
- School of Engineering and Applied Science Distinguished Scholar Award to the senior who graduates with the highest standing:* Paul Metz Haldeman, Jr.
- School of Government and Business Administration's International Business Program Award for outstanding scholarship and leadership abilities:*
Undergraduate: Jay Dickson White
Graduate: Din Merican
- Sigma Tau Award in Engineering and Applied Science to the freshman who maintains the highest scholastic standing in the work of the entire year:* Imad Golmieh
- Smith Kline & French Award for the best undergraduate research project in Psychology:* Doris Winifred Babb
- Staughton Award in Latin:* William Bell Ray, Jr.
- James MacBride Sterrett, Jr., Award in Physics:* Stephen David Forner
- Charles Clinton Swisher Historical Club Award to the student who submits the best essay covering some phase of medieval history:* Analouise Clissold Bolten
- Theta Tau Activities Award in Engineering and Applied Science to the senior with the most outstanding record in activities for the entire period of his attendance:* Jerrold Leonard Bonn
- United States Law Week Award to an outstanding senior law student:* Linda Ann Cincinnati
- Upjohn Achievement Award to a member of the graduating class of the School of Medicine for outstanding scholastic and personal achievement:* Paul Dennis Miller
- The Wall Street Journal Leadership Award to the graduating senior in the School of Government and Business Administration for outstanding leadership and service to the University:* Scott Louis Baena
- Thomas F. Walsh Award to that student who submits the best essay in Irish History:* Duane LeRoy Charles Galles

ALUMNI AND ALLIED ASSOCIATIONS

THE GENERAL ALUMNI ASSOCIATION

The objectives of this association are to unite the graduates who wish to associate themselves for charitable, educational, literary, and scientific purposes, and to promote the general welfare of the University.

Eligible members are those who have matriculated in any school of the University and who have left the University in good standing, or any person who is or has been a member of the teaching, research, or administrative staff of the University or the Board of Trustees of the University. Active members are those eligible members who are current contributors (dues or otherwise) to or life members of the George Washington University General Alumni Association, the Alumni Association of any school of the University, or contributors to the George Washington University Fund.

The Alumni Office is in Bacon Hall, 2000 H Street N.W., Washington, D.C. 20006.

All alumni are urged to keep the Alumni Office informed of changes of address or occupation and to supply information with regard to their fellow alumni.

RECIPIENTS OF ALUMNI ACHIEVEMENT AWARDS

February 21, 1970

Everett Hollis Bellows, B.A. 1939, M.A. 1941

Francis Patrick Scott, B.S. 1934

June 7, 1970

Francis Robison Kirkham, J.D.(WHH), 1931, B.A. 1932

Zelda Diamond Fichandler, M.A. 1950

RECIPIENTS OF ALUMNI SERVICE AWARDS

April 18, 1970

John R. Busick, B.A. 1936

Lyman H. Dishman, LL.B. 1925, B.A. 1931

Jack B. Kleh, B.A. 1941, M.D. 1944

William J. Rochelle, B.A. 1938, J.D. 1940

Elma Williams, B.A. 1954

GOVERNING BOARD 1970-71

President. — J. Dallas Shirley, B.S. in P.E. 1936, M.A. in Ed. 1945

Vice President. — Lyn Henderson Clark, B.A. 1954

Treasurer. — Glen A. Wilkinson, J.D. (WHH) 1938

Secretary. — Nancy Broyhill Dudley, B.A. in Govt. 1965

Columbian College of Arts and Sciences:

Lyn Henderson Clark, B.A. 1954

Sue Burnett Panzer, B.A. 1941

Michael Sussman, B.A. 1969

Graduate School of Arts and Sciences:

Carl A. Linden, Ph.D. 1966

William F.E. Long, B.A. 1946, M.A. 1947, Ph.D. 1967

Edwin Lee White, B.A. 1922, M.S. 1925

School of Medicine:

Harvey H. Ammerman, B.S. 1939, M.D. 1943

Marvin Footer, B.A. 1938, M.D. 1942

Dee R. Parkinson, M.D. 1943

National Law Center:

Henry A. Berliner, Jr., J.D. (WH) 1964

Fred H. Daly, J.D. 1966

Glen A. Wilkinson, J.D. (WHH) 1938

School of Engineering and Applied Science:

Laurence R. Brown, B.S. in Engr. 1949, D.B.A. 1968

William H. Holt, B.S. in Engr. 1957, LL.B. 1961

Edward A. Wareham III, B.E.E. 1953

School of Education:

Howard O. Johnson, M.A. in Ed. 1948, Ed.D. 1950

Richard Ray Roberts, M.A. in Ed. 1957, Ed.D. 1964

J. Dallas Shirley, B.S. in P.E. 1936, M.A. in Ed. 1945

School of Government and Business Administration:

Robert A. Aleshire, B.A. in Govt. 1963, M.P.A. 1966

William B. Belford, M.A. in Govt. 1960

Fred Winfield Weitzel, B.A. in Govt. 1958

School of Public and International Affairs:

John Alton Boyer, B.A. in Govt. 1948, J.D. 1950

Nancy Broyhill Dudley, B.A. in Govt. 1965

Norman C. Neverson, B.A. 1967

College of General Studies:

Reginald D. Barta, B.A. 1958, M.A. 1965

Thomas R. Downs, M.B.A. 1961, M.S. in Per. Adm. 1966

Geraldine Werner, B.A. 1948

Faculty:

Douglas L. Jones, B.M.E. 1963, M.S. in Engr. 1965, D.Sc. 1970

Joseph L. Métevier, Jr., B.A. 1951, M.A. 1955

Alumni Trustees:

Everett H. Bellows, B.A. 1939, M.A. 1941

Harold K. Bradford, LL.B. 1942

Harry F. Dowling, M.D. 1931

Thaddeus A. Lindner, B.A. in Govt. 1951

Beverly Ann Oliphant, M.D. 1969

William G. White, B.S. in C.E. 1936

Regional Representatives 1969-70:

Atlanta — John V. Skinner, J.D. 1961

Cincinnati — Robert J. Jones, B.A. 1949

Dallas — Harold M. Young, B.A. 1926

Denver — Harold W. Hudson, B.A. in Govt. 1941

Florida West Coast — Lewis Weiss, J.D. (Nat'l) 1930

Los Angeles — Philbrick McCoy, LL.B. 1922, LL.M. 1923, LL.D. 1957

Miami — Abiah A. Church, B.A. 1948, J.D. 1950

Milwaukee — Donald W. Cole, M.B.A. 1957

New York City — Hugh S. Wertz, B.S. in E.E. 1929, J.D. 1935

- North Jersey — John R. Busick, B.A. 1936
 Philadelphia — Kimber E. Vought, B.A. in Govt. 1943
 Phoenix — Frank A. Parks, LL.B. 1964
 St. Louis — William P. Oliver, Jr., J.D. 1949, M.A. in I.A. 1967
 San Francisco — Angelo May, M.D. 1937
 Salt Lake City — Vernon Romney, J.D. 1922
 Seattle — Oscar A. Zabel, J.D. 1926

THE GEORGE WASHINGTON UNIVERSITY MEDICAL ALUMNI ASSOCIATION

The George Washington University Medical Alumni Association, incorporated in 1959, continues the organization previously known as The George Washington University Medical Society.

The stated purposes of the Association are as follows: "This shall be a nonprofit organization international in scope, whose objectives shall be to provide constructive services for the alumni of the George Washington University School of Medicine, for furthering the art and science of medicine, research, and for the promotion of the welfare of the George Washington University School of Medicine, its students, the George Washington Hospital and its trainees."

Active membership in the Association consists of all graduates of the School of Medicine; current members and, on application, past members of the teaching staff of the School of Medicine who hold Doctor's degrees; Doctors of Medicine who have had one or more years of postgraduate training in the George Washington University Hospital. Junior membership consists of all members of the student body of the School of Medicine during the time they are students.

The Medical Alumni Association maintains an office in the School of Medicine at 1331 H Street, N.W., Washington, D.C.

OFFICERS FOR 1970-71

- President.* — Jerome Canter, M.D. 1955
President Elect. — Marvin P. Footer, B.A. 1938, M.D. 1942
Regional Vice President. — Tobias R. Funt, M.D. 1950
Regional Vice President. — Howard G. McQuarrie, M.D. 1955
Secretary. — John F. Mermel, M.D. 1960
Treasurer. — Donald H. Glew, Jr., M.D. 1948

Executive Council:

- Jerome Epstein, M.A. 1948, M.D. 1953
 Maurice Gromet, B.A. 1931, M.D. 1934
 Richard I. Kilstein, B.A. 1931, M.D. 1934
 Jack B. Kleh, B.A. 1942, M.D. 1944
 Angelo May, M.D. 1937
 Carolyn Pincock, B.A. 1931, M.D. 1934
 Morris Rosenberg, B.A. 1938, M.D. 1941
 Carlos A. Silva, M.D. 1960
 George Speck, M.D. 1941
 Allan Zellis, M.D. 1941

THE GEORGE WASHINGTON LAW ASSOCIATION

The George Washington Law Association was founded in 1912 and has been affiliated with the General Alumni Association since 1926. Its purposes as stated in the constitution are to promote high standards of legal education, to keep the alumni of the school in close touch with one another, especially with members of their own classes, to gather and publish at

intervals information as to the whereabouts and activities of these alumni, and to further the interests of the school.

Eligible members are those who have matriculated in the school or National University and have left in good standing, and any member or former member of the faculty of the school. Active members are those eligible members who are current contributors to the Law Annual Support program of the University and life members of the George Washington Law Association.

The Association plans publication periodically of the Law Alumni Directory. Law Alumni are urged to keep the Alumni Office informed of their whereabouts so that directory information can be kept up to date.

OFFICERS FOR 1970-71

President. — Philip F. Herrick, LL.B. 1933, LL.M. 1936

First Vice President. — F. Elwood Davis, LL.B. 1943

Second Vice President. — Marion Edwyn Harrison, LL.B. 1954, LL.M. 1959

Third Vice President. — Richard A. Ward, B.A. 1961, J.D. (WH) 1965

Secretary. — Betty Ann Thompson, B.A. 1946, LL.B. 1948

Treasurer. — Michael P. Bentzen, LL.B. 1964

Executive Committee:

Henry A. Berliner, Jr., J.D. (WH) 1964

Joseph D. Bulman, LL.B. 1931

James C. Cacheris, J.D. (WH) 1960

Alvin Capp, B.A. 1961, J.D. (WH) 1964

Fred H. Daly, J.D. 1966

Joseph A. DePaul, LL.B. 1950

Rae Ann Fichtner, J.D. 1952

Lloyd Fletcher, J.D. (WH) 1939

Philip A. Gragan, B.A. 1953, J.D. (WH) 1959

Harold H. Greene, J.D. (WH) 1952

Paul F. Hannah, J.D. (WH) 1933

C. Timothy Hopkins, LL.B. 1963

Joseph L. Horne, J.D. (WH) 1951, LL.M. 1964

Samuel J. L'Hommedieu, Jr., LL.B. 1951, LL.M. 1952

James R. Loftis III, J.D. (WH) 1968

William H. McCullough, LL.B. 1950

Milton E. Mermelstein, B.A. 1930, J.D. 1931

Milan C. Miskovsky, LL.B. 1956

Donald L. Mooers, LL.B. 1963

Bernard I. Nordlinger, B.A. 1929, J.D. (WH) 1933

Kenneth W. Parkinson, B.A. 1950, LL.B. 1952

Paul L. Pascal, J.D. 1965

Thomas D. Phelps, J.D. 1963

B. R. Pravel, J.D. (WH) 1951

Harry M. Reid, J.D. 1964

James Robertson, LL.B. 1965

Robert D. Rolander, LL.B. 1953

Walter F. Sheble, J.D. 1952, LL.M. 1953

John V. Skinner, J.D. (WH) 1962

Thomas F. Smegal, J.D. 1961

Janet A. Spragens, J.D. (WH) 1968

Ethan B. Stroud, LL.M. 1956

Gary L. Theurer, J.D. 1954

Robert P. Visser, J.D. (WH) 1966

Sterry R. Waterman, Law (1926)

Glen A. Wilkinson, J.D. (WH) 1938

George F. Wilsey, J.D. (WH) 1958

- Leon L. Wolfstone, J.D. (WH) 1939
 Joseph S. Wright, Jr., LL.B. 1963
 Raymond W. Young, J.D. (WH) 1957
 Oliver Gasch, ex officio, LL.B. 1932

THE ENGINEER ALUMNI ASSOCIATION OF THE GEORGE WASHINGTON UNIVERSITY, INC.

The Engineer Alumni Association was organized in 1936 and was incorporated in 1962. It has worked closely with the General Alumni Association since its organization. Its objects are to unite the graduates and Faculty of the School in closer fellowship, to promote the general welfare of the School and the University at large, to foster activities of the engineering organizations recognized by the University, and to advance the profession of engineering in general.

OFFICERS FOR 1970-71

- President.** — Douglas L. Jones, B.M.E. 1963, M.S. in Engr. 1965, D.Sc. 1970
Vice President. — Arthur E. Proctor, B.E.E. 1953
Secretary. — Rolph Albert, M.E.A. 1965
Treasurer. — John R. Manning, B.S. in Engr. 1957, J.D. 1961
Board of Trustees:
 Delany F. deButts, B.C.E. 1962
 Solomon S. Fineblum, B.M.E. 1950, M.S. in Engr. 1962
 Matthew Flato, B.E.E. 1949
 William H. Holt, B.S. in Engr. 1957, LL.B. 1961
 Raymond P. Morales, B.S. (E.E.) 1966
 Delmer C. Ports, B.S. in E.E. 1937
 James Sinsabaugh, B.M.E. 1949
 Edwin O. Stengard, B.M.E. 1948
 H. Moffett Tharpe, Jr., B.E.E. 1961, M.S. in Engr. 1966
 Edward A. Wareham III, B.E.E. 1953
 Elmer W. Whitlock, Jr., B.E.E. 1954

THE SCHOOL OF EDUCATION ALUMNI ASSOCIATION

The School of Education Alumni Association was organized during the academic year 1968-69 in order to enlist the collective efforts and prestige of concerned alumni in shaping institutional goals and fostering continual growth and progress. Pursuant to these purposes, the Association, through social as well as academically-oriented gatherings, intends to strengthen the rapport among members and contribute to their professional advancement.

OFFICERS FOR 1970-71

- President.** — Norman E. Hearn, Ed.D. 1969
Vice President. — Avis T. Hawkins, M.A. in Ed. 1965
Secretary. — Mary B. Curry, M.A. in Ed. 1950, Ed.D. 1968
Treasurer. — Mary Mooney, B.A. in Ed. 1961
Governing Board:
 Milton J. Bailey, M.A. in Ed. 1955, Ed.D. 1968
 Jane S. Bernot, B.S. in P.E. 1945
 Robert I. Bickford, M.A. in Ed. 1964, A.P.C. 1965
 Francis V. Corrigan, Ed.D. 1970
 James J. Decker, M.A. in Ed. 1966, Ed.D. 1970
 Helen M. Flint, Ed.D. 1957
 LeRoy R. Fullerton, Ed.D. 1967

James W. Jacobs, B.S. in P.E. 1949, M.A. in Ed. 1952, Ed.D. 1964
 Samuel Kavruck, M.A. in Govt. 1950, Ed.D. 1954
 James A. Lally, Jr., Ed.D. 1966
 Julius A. Levay, M.A. in Ed. 1961, Ed.D. 1966

THE LIBRARY SCIENCE ALUMNI ASSOCIATION

The Library Science Alumni Association was organized in 1932 by graduates of the Division of Library Science and became an affiliate of the General Alumni Association in 1935. It was established to foster a closer relationship between the Faculty and graduates and to further the interests of the Division of Library Science and of the University as a whole.

OFFICERS FOR 1970-71

President. — Mildred C. Benton, B.A. in L.S. 1934
Vice President. — Mrs. Charles A. Quattlebaum, B.A. in L.S. 1939
Secretary. — Mary E. Kelso, B.A. in L.S. 1940
Treasurer. — Elinor Dunnigan, B.A. in L.S. 1930, M.A. 1932

THE GEORGE WASHINGTON UNIVERSITY NURSES ASSOCIATION

The George Washington University Nurses Association was organized in 1914. In 1936, this organization was made an integral part of the General Alumni Association, and graduates of the School of Nursing were accorded associated membership. The objects of the Association are to hold in unison the graduates of the George Washington University Hospital School for Nurses, to care for its sick members, and to promote the advance of nursing in the interest of the George Washington University Hospital.

OFFICERS FOR 1970-71

President. — Claudine Thomas
Secretary. — Juanita Love
Treasurer. — Alma Binks

WOMEN'S PHYSICAL EDUCATION ALUMNAE ASSOCIATION

The purpose of this organization is to foster and promote the teaching profession in the fields of Physical Education, Health, and Recreation. Its functions are (1) to attract students to the profession who show evidence of outstanding teaching capability, (2) to offer professional guidance to members in this field of work, (3) to render service to the community, and (4) to render service to the University.

OFFICERS FOR 1970-71

President. — Jane S. Bernot, B.S. in P.E. 1945
Secretary. — Lyndale H. George, B.S. in P.E. 1948, M.A. in Ed. 1952, A.P.C. 1961
Treasurer. — Calva C. Collier, B.S. in P.E. 1949
Council:

Patricia A. Bergan, B.S. in P.E. 1967
 Theresa Conroy, B.S. in P.E. 1963
 Camille Craig, B.S. in P.E. 1942, M.A. in Ed. 1952
 Lucie Haid, B.S. in P.E. 1940
 Laura Mulligan, B.S. in P.E. 1940
 Nan B. Smith, B.S. in P.E. 1962, M.A. in Ed. 1966
 Loretta M. Stallings, ex officio

REGIONAL ALUMNI CLUBS

Regional alumni clubs sponsored by the General Alumni Association are active in a number of areas. Information about the officers and activities of these clubs may be obtained from the Alumni Office of the University.

THE LETTERMEN CLUB

The membership of this organization shall consist of those men who, for participation in a sport at George Washington University, have been awarded varsity letters or freshmen numerals, who are no longer undergraduate students of the University; and those men who, for managing a freshman or varsity sport, received letters or numerals.

The objectives of the club are to (1) bring together on a social level former lettermen of all sports, (2) renew acquaintances and promote fellowship, (3) encourage higher ideals of intercollegiate athletics at the University, and (4) assist the University in matters pertaining to athletics when requested.

OFFICERS FOR 1970-71

- President.* — Joseph J. Bernot, B.S. in P.E. 1950, M.A. in Ed. 1953
Vice President. — Peter P. Labukas, B.S. in P.E. 1947, M.A. in Ed. 1948, A.P.C. 1959
Secretary. — Vincent J. DeAngelis, B.S. in P.E. 1939, M.A. in Ed. 1948
Treasurer. — Stephen J. Korcheck, B.S. in P.E. 1954, M.A. in Ed. 1966

THE COLUMBIAN WOMEN

The objectives of this organization are (1) the promotion of acquaintanceship among its members, (2) the advancement of women by the founding of scholarships in the various departments of the University, and (3) the promotion of the interests of the University.

MEMBERSHIP

The following persons shall be eligible for active membership: (1) any woman who is currently registered or has been previously registered as a student in the George Washington University; (2) any woman member of the Faculties or Board of Trustees, any woman on the administrative staff; the wife of any member of the Faculties, Board of Trustees, or the administrative staff; and (3) any woman recipient of an honorary degree from the University.

OFFICERS FOR 1970-71

- President.* — Hazel Smallwood (Mrs. William B.) Hanback, B.A. 1940
Immediate Past President. — Sue Burnett (Mrs. Irving R.M.) Panzer, B.A. 1941
First Vice President. — Mary Barker (Mrs. Harry A.) Carson, M.A. 1957
Second Vice President. — Elizabeth Middlemas, B.A. 1934, M.A. 1941
Recording Secretary. — Bonnie L. Selinsky, B.A. 1966
Corresponding Secretary. — Hazel Bayne, B.A. 1925, M.A. 1930
Assistant Corresponding Secretary. — Maxine Rolle (Mrs. Augustus) Goodyear, B.A. 1924, M.A. 1925
Treasurer. — Ruth E. Myer, M.A. in Govt. 1946
Assistant Treasurer. — Nan B. Word, B.A. 1958
Historian. — Edith Maslin (Mrs. Finn) Ronne, B.A. 1940
General Counsel. — Mary M. Connelly, LL.B. 1922

THE WOMEN'S BOARD OF THE GEORGE WASHINGTON UNIVERSITY HOSPITAL

The object of this organization is to aid in every way the interests and advancement of the George Washington University Hospital. Meetings are held on the first Wednesday of each month, October to June, inclusive.

OFFICERS FOR 1970-71

Honorary President. — Mrs. Cloyd H. Marvin
President. — Mrs. Alvin E. Parrish
First Vice President. — Mrs. Reginald E. Pledger
Second Vice President. — Mrs. Charles W. Thompson
Third Vice President. — Mrs. Robert S. Wild
Recording Secretary. — Mrs. Robert M. Silliman
Corresponding Secretary. — Mrs. Boyd L. Burris
Assistant Corresponding Secretary. — Mrs. A. Prentice Kenyon
Treasurer. — Mrs. Carl H. Walther
Assistant Treasurer. — Mrs. J. Blaine Harrell
Directors:
 Mrs. Samuel M. Burgess II
 Mrs. James J. Feffer
 Mrs. John Parks
 Mrs. Joseph H. Roe

MEMBERSHIP

The following persons shall be eligible for active membership: (1) any woman who is currently registered or has been previously registered as a student in the George Washington University; (2) any woman member of the Faculties or Board of Trustees; any woman on the administrative staff; the wife of any member of the Faculties, Board of Trustees, or the administrative staff; and (3) any woman recipient of an honorary degree from the University.

OFFICERS FOR 1970-71

President. — Hazel Smallwood (Mrs. William B.) Harback, B.A. 1940
Immediate Past President. — Sue Burnett (Mrs. Irving R.M.) Parnes, B.A. 1941
First Vice President. — Mary Barker (Mrs. Harry A.) Cannon, M.A. 1937
Second Vice President. — Elizabeth Midkiff, B.A. 1934, M.A. 1941
Recording Secretary. — Bonnie L. Schinsky, B.A. 1966
Corresponding Secretary. — Hazel Bayne, B.A. 1952, M.A. 1950
Assistant Corresponding Secretary. — Maxine Rolle (Mrs. Augustus) Goodyear, B.A. 1934, M.A. 1952
Treasurer. — Ruth E. Myer, M.A. in Govt. 1946
Assistant Treasurer. — Nan B. Word, B.A. 1938
Honorary. — Edith Martin (Mrs. Finn) Rones, B.A. 1940
General Counsel. — Mary M. Connolly, LL.B. 1932

STATISTICAL RECORD

Summary of Registration 1969-70

	FALL SEMESTER			SPRING SEMESTER		
	Men	Women	Total	Men	Women	Total
COLUMBIAN COLLEGE OF ARTS AND SCIENCES						
Lower Division	1,480	1,471	2,951	1,384	1,368	2,752
Upper Division	663	967	1,630	647	919	1,566
Unclassified	-	-	-	-	1	1
Total	2,143	2,438	4,581	2,031	2,288	4,319
GRADUATE SCHOOL OF ARTS AND SCIENCES						
Masters Candidates	303	398	701	281	364	645
Doctor of Philosophy	443	206	649	425	204	629
Unclassified	3	1	4	1	1	2
Total	749	605	1,354	707	569	1,276
SCHOOL OF MEDICINE						
Doctor of Medicine	397	38	435	393	37	430
NATIONAL LAW CENTER						
Juris Doctor	1,122	135	1,257	1,051	129	1,180
Master's and Doctor's Degrees	268	12	280	258	11	269
Unclassified	116	10	126	99	4	103
Total	1,506	157	1,663	1,408	144	1,552
SCHOOL OF ENGINEERING AND APPLIED SCIENCE						
Undergraduate	270	3	273	253	5	258
Graduate	1,160	19	1,179	1,099	16	1,115
Unclassified	57	-	57	36	-	36
Total	1,487	22	1,509	1,388	21	1,409

	FALL SEMESTER			SPRING SEMESTER		
	Men	Women	Total	Men	Women	Total

SCHOOL OF EDUCATION

Undergraduate	23	194	217	24	194	218
Graduate	391	470	861	411	483	894
Unclassified	24	25	49	11	11	22
Total	438	689	1,127	446	688	1,134

SCHOOL OF GOVERNMENT AND BUSINESS ADMINISTRATION

Undergraduate	147	23	170	149	23	172
Graduate	1,049	121	1,170	1,015	119	1,134
Unclassified	28	2	30	39	4	43
Total	1,224	146	1,370	1,203	146	1,349

SCHOOL OF PUBLIC AND INTERNATIONAL AFFAIRS

Undergraduate	130	93	223	113	90	203
Graduate	144	47	191	131	38	169
Total	274	140	414	244	128	372

COLLEGE OF GENERAL STUDIES

Undergraduate*						
Directed by SGBA	44	7	51	26	2	28
Directed by Col.Col.	—	—	—	19	5	24
Graduate	59	1	60	68	2	70
Unclassified	6	1	7	5	2	7
Total	109	9	118	118	11	129

DIVISION OF UNIVERSITY STUDENTS

University Students	1,201	912	2,113	1,031	759	1,790
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SUMMARY

Undergraduate	2,757	2,758	5,515	2,615	2,606	5,221
Graduate	5,336	1,447	6,783	5,132	1,403	6,535
Unclassified	1,435	951	2,386	1,222	782	2,004
Total	9,528	5,156	14,684	8,969	4,791	13,760

SUMMER SESSIONS REGISTRATION 1969

Men	3,150
Women	2,012
Total	5,162

*Beginning Spring 1970 the on-campus undergraduates in the College of General Studies were divided according to those in curricula directed by the School of Government and Business Administration or by Columbian College.

COLLEGE OF GENERAL STUDIES Off-Campus Study

	FALL SEMESTER			SPRING SEMESTER		
	Men	Women	Total	Men	Women	Total
Degree Candidates						
Undergraduate	304	67	371	343	60	403
Graduate	1,582	54	1,636	1,727	54	1,781
Total	1,886	121	2,007	2,070	114	2,184
Nondegree Status	3,559	704	4,263	3,049	676	3,725
Total	5,445	825	6,270	5,119	790	5,909

SUMMER SESSIONS 1969

Degree Candidates			
Undergraduate	175	16	191
Graduate	790	25	815
Total	965	41	1,006
Nondegree Status	1,273	257	1,530
Total	2,238	298	2,536

GEOGRAPHICAL DISTRIBUTION OF STUDENTS

UNITED STATES, TERRITORIES AND POSSESSIONS

FALL SPRING			FALL SPRING		
Alabama	27	29	Nebraska	33	30
Alaska	5	5	Nevada	12	14
Arizona	18	14	New Hampshire	33	30
Arkansas	7	8	New Jersey	1,000	956
California	211	183	New Mexico	14	14
Colorado	44	41	New York	1,648	1,534
Connecticut	391	353	North Carolina	75	63
Delaware	74	63	North Dakota	4	5
District of Columbia	2,089	1,960	Ohio	269	247
Florida	178	157	Oklahoma	27	25
Georgia	59	58	Oregon	18	19
Hawaii	23	26	Pennsylvania	762	723
Idaho	27	25	Rhode Island	62	57
Illinois	191	180	South Carolina	37	36
Indiana	72	67	South Dakota	18	18
Iowa	35	35	Tennessee	32	32
Kansas	46	47	Texas	119	113
Kentucky	32	35	Utah	41	37
Louisiana	23	23	Vermont	19	18
Maine	38	38	Virginia	2,742	2,576
Maryland	2,596	2,451	Washington	72	63
Massachusetts	410	367	West Virginia	40	31
Michigan	106	93	Wisconsin	53	48
Minnesota	31	35	Wyoming	11	10
Mississippi	17	17	Panama Canal Zone	4	2
Missouri	75	73	Puerto Rico	14	15
Montana	14	16	Virgin Islands	7	7

FOREIGN COUNTRIES

	FALL	SPRING		FALL	SPRING
Afghanistan	1	1	Italy	6	5
Algeria	1	1	Ivory Coast	—	1
Argentina	8	5	Jamaica	5	4
Australia	4	3	Japan	12	10
Austria	1	1	Jordan	3	4
Bahamas	—	1	Kenya	2	2
Belgium	3	3	Korea	27	26
Biafra	2	4	Kuwait	1	1
Bolivia	5	3	Lebanon	4	4
Brazil	9	11	Liberia	6	4
British Guiana	2	3	Libya	3	3
British West Indies	1	1	Malaysia	4	3
Bulgaria	1	1	Mexico	5	4
Burma	1	1	Netherlands	6	8
Canada	14	12	Nicaragua	4	2
Ceylon	1	1	Nigeria	4	8
Chile	6	7	Norway	1	2
China	25	20	Pakistan	6	6
Columbia	9	10	Panama	6	1
Congo, Republic of	1	1	Paraguay	1	1
Costa Rica	2	2	Peru	5	5
Cuba	21	19	Philippines, Republic of	29	23
Cyprus	—	1	Poland	1	1
Czechoslovakia	1	1	Portugal	—	2
Denmark	1	—	Rhodesia	2	2
Dominican Republic	2	—	Rumania	—	1
Ecuador	2	2	Saudi Arabia	6	5
Egypt	6	3	Scotland	2	3
El Salvador	3	2	Sierra Leone	2	1
England	23	20	South Africa	2	1
Estonia	1	1	Spain	2	1
Ethiopia	1	1	Sweden	3	1
Finland	1	4	Switzerland	1	2
France	26	28	Syria	3	6
Gambia	1	1	Taiwan	4	4
Germany	20	22	Tanzania	2	7
Ghana	3	3	Thailand	8	1
Greece	12	11	Togo	1	1
Guatemala	5	2	Trinidad	3	3
Haiti	5	4	Tunisia	1	1
Honduras	1	1	Turkey	10	6
Hong Kong	4	4	United Arab Republic	6	5
Hungary	1	1	Uruguay	6	7
India	53	46	Venezuela	6	5
Indonesia	5	6	Viet Nam	6	3
Iran	17	17	West Indies Federation	2	2
Iraq	2	1	Yugoslavia	2	3
Ireland	2	1	Stateless	5	—
Israel	9	8			
Puerto Rico	—	—			
Virgin Islands	—	—			

Summary of Degrees Conferred 1969-70

	Sum- mer	Feb.	June	Total
Associate in Arts	—	4	2	6
Bachelor of Arts — Columbian	122	121	601	844
Bachelor of Arts — SPIA	14	8	78	100
Bachelor of Arts in Education	13	10	81	104
Bachelor of Business Administration	18	16	64	98
Bachelor of Science — Columbian	2	4	30	36
Bachelor of Science (Civil Engineering)	4	4	5	13
Bachelor of Science (Electrical Engineering)	5	1	22	28
Bachelor of Science (Mechanical Engineering)	1	1	5	7
Bachelor of Science in General Studies — Columbian	4	3	3	10
Bachelor of Science in General Studies — SGBA	16	20	36	72
Bachelor of Science in Geodetic and Cartographic Science	1	—	3	4
Bachelor of Science in Medical Technology	11	—	—	11
Bachelor of Science in Physical Education	—	2	6	8
Doctor of Business Administration	1	5	15	21
Doctor of Education	6	9	11	26
Doctor of Juridical Science	1	—	2	3
Doctor of Medicine	—	—	99	99
Doctor of Philosophy	17	25	31	73
Doctor of Science	3	5	4	12
Education Specialist	7	4	10	21
Graduate Certificate in Health Care Administration	1	1	—	2
Juris Doctor	37	26	190	253
Master of Arts — Grad A&S	25	35	45	105
Master of Arts — SPIA	7	12	9	28
Master of Arts in Education	118	48	140	306
Master of Arts in Government	3	5	7	15
Master of Arts in Teaching	—	—	30	30
Master of Business Administration	77	68	107	252
Master of Comparative Law	—	1	1	2
Master of Comparative Law (American Practice)	—	2	1	3
Master of Engineering Administration	9	20	32	61
Master of Fine Arts	6	1	13	20
Master of Laws	23	22	38	83
Master of Music	—	1	—	1
Master of Philosophy	9	24	15	48
Master of Public Administration	2	1	3	6
Master of Science — Grad A&S	8	11	13	32
Master of Science — SEAS	16	32	29	77
Master of Science in Administration	19	64	120	203
Master of Science in Business Administration	77	8	8	93
Master of Science in Engineering	—	—	1	1
Master of Science in Financial Management	4	16	12	32
Master of Science in Governmental Administration	3	10	14	27
Master of Science in International Affairs	221	9	13	243
Master of Science in Personnel Administration	20	32	24	76
Master of Science in Public Administration	1	—	10	11
TOTAL	932	692	1983	3607

Teaching Staff 1969-70

Professors Emeriti	65
Professors	250
Research Professors	13
Adjunct Professors	13
Visiting Professors	14
Visiting Research Professors	1
Ambassador in Residence	1
Professorial Lecturers	120
Clinical Professors	65
Associate Professors	205
Associate Research Professors	15
Adjunct Associate Professors	4
Visiting Associate Professors	2
Associate Professorial Lecturers	91
Associate Clinical Professors	131
Assistant Professors	194
Assistant Research Professors	15
Adjunct Assistant Professors	7
Visiting Assistant Professors	3
Assistant Professorial Lecturers	111
Assistant Clinical Professors	306
Instructors	73
Research Instructors	1
Lecturers	84
Adjunct Lecturers	10
Studio Lecturers	53
Special Lecturers	21
Clinical Instructors	232
Clerk of the Trial Practice Court	1
Graduate Teaching Fellows	141
Fellows in the School of Medicine	35
Assistants in the School of Medicine	145
Fellows (nonmedical)	4

2,426

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